

TARTU ÜLIKOOLI BOTAANIKAMUSEUMIST
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EESTI TAIMED

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WITH A SUMMARY:
ESTONIAN PLANTS

TARTU 1933

Möödunud sajandi keskel prof. A. v. Bunge poolt algatatud „Flora exsiccata Liv-, Est- und Curlands“, milline rohkesti Eesti materjale sisaldas, on käesoleval ajal suureks haruldiseks. Asudes uue, „Eesti Taimed'e“ nimelise ekssikaatkogu väljaandmisele on Botaanikamuuseum teadlik sellega seotud raskustest, sest Eesti botaanilises uurimises on veel suuri lünki täita, floristiline andmestik üksikute alade kohta on puudulik ja taimesotsioloogilisi uuringuid alles vähe; et tarvidus uue ekssikaatkogu järele siiski olemas, lähtus muuseum selle ürituse oma töökavva võtmisel ka teadmised, et selline algatus vaid soodsalt võib mõjustada Eesti ala edaspidist botaanilist uurimist. Peale puhtsüstemaatilise-floristilise külje püütakse erilist rõhku panna ka liikide taimesotsioloogilisele ja taimegeograafilisele asetusele; viimase selgituseks on üksikute iseloomulikimate liikide levimiskitsid, mis loomulikult ei taha ega saagi olla lõplikud, vaid ainult meie praeguste teadmiste illustratsiooniks nende liikide levingu üle Eestis.

Botaanikamuuseumi algatus on nii eriteadlasis kui ka meie botaaniliste huvidega haritlaskonnas, kelle poole muuseum kaastöö saamiseks pööras, elavat vastukaja leidnud, ja käesoleva esimese mapi koostamisel on muuseum võinud kasustada paljude isikute kaastööd liikide herbaarse materjali ja kaardistamiseks vajalikkude floristiliste andmete kujul. Esimese mapi kaastöölisteks on: pr. stud. T. Amitan-Ruckteschell, G. Avajev, J. Eplik, B. Fromhold-Treu, stud. A. Jürriis, stud. V. Knuut, prof. K. R. Kupffer, dots. E. Lepik, pr. H. Lippmaa, W. Loewis of Menar, P. Lukin, J. Lunts, G. Mechmershausen, dr. A. Miljan, mag. K. Mölder, Th. Nenjukov, prl. stud. E. Pastak, prl. J. Rebane, A. Reeben, dr. W. Reinthal, mag. A. Rühl, dr. B. Saarson, dr. H. Salasoo, L. Sepp, stud. V. Sirgo, stud. E. Sits, prof. Edm. Spöhr, mag. J. Talts, pr. mag. S. Talts, eradots. P. W. Thomson, A. Tomson, prl.

stud. E. Truus, prov. J. Tõll, A. Üksip, mag. A. Vaga, Ed. Viirok, dr. G. Vilberg, pr. A. Vitsut, pr. stud. C. Volmer. — Tuleb eriti toonitada prof. K. R. Kupffer'i, botaanik Th. Nenjukov'i ja eradots. dr. P. W. Thomson'i lahket kaasabi.

Suurematest herbaariumitest on peale Botaanikamuuseumi Eesti Herbaariumi võidud kasustada Tartu Ülikooli juures oleva Loodusuurijate Seltsi ja Tallinna Provintsiaalmuuseumi herbaariume, samuti Tallinna Rahvaülikooli Seltsile kuuluvat E. Niklasen'i herbaariumi.

On selge, et T. Ü. Botaanikamuuseum suudab oma üritust jätkata ja lõpule viia vaid suurema hulga püsivate väliskaastöölise abil; selleks vajab ta ka edaspidi kõikide meie botaaniliste huvidega isikute kaasabi, nagu see nii rõõmustaval kombel osaks on saanud „Eesti Taimede“ esimesele mapile.

Eesti taimestik, samuti kui naabermaade oma, on võrdlemisi noor: ta hakkas kujunema siin alles pärast jääaega. Alates Balti paisjärve aegse arktilise ajajärgu taimkattega (umbes 10 700 a. tagasi) on meil käesoleva ajani valitsenud mitu erinevat kliimaperioodi; see vaheldusrikas minevik võimaldas kord ühtede, kord teiste taimeliikide sisserändamist, milleks niigi oli soodus Eesti ala geograafiline asend suure Euraasia mandri lääneserval Läänemere kaldal. On siis ka üsna loomulik, et Eestis mitmed Lääne-Euroopa taimeliigid asuvad oma levimisala idapiiril, samuti rida Vene ja Siberi kontinentalseid liike — läänepiiril. Esimeste hulka kuuluvad *Hedera helix*, *Hydrocotyle vulgaris*, *Myrica gale* jne. Teisest rühmast olgu mainitud *Chamaedaphne calyculata*, *Scolochloa festucacea*, *Carex laevirostris*, *Mochringia lateriflora* jt.

Mitmesuguse kliimalise päritoluga liikide säilumine koos vahelduvate edaafiliste teguritega, lõpuks merest sõltuvate halofüütide juurdetulek põhjustavad Eesti taimkatte küllalt suure mitmekesisuse ja liikiderikkuse. Õistaimede ja soon-eostaimede arv on üle 1100 (arvestamata *Alchemilla*, *Melampyrum*, *Taraxacum* ja *Hieracium* pisiliike). Eriti liigirikkad on aga saared: Saare- ja Muhumaa moodustavad vaid $\frac{1}{16}$ kogu Eesti pindalast ja neil puudub ümmarguselt ainult 200 liiki, ehk teisiti — nende flooras on $\frac{4}{5}$ meie liikide üldarvust esindatud.

Eesti taimegeograafilise uurimise aluseks on Fr. Schmidt'i, K. R. Kupffer'i, T. Lippmaa ja P. W. Thomson'i tööd. Nendele põhjeneb peajoontes ala üldine taimegeograafiline jaotus; üksikasjalisem taimegeograafiliste valdkondade ja all-valdkondade piiritletus ja eraldamine nõuavad täiendavaid uurimisi.

Et Eesti (ühes Lätiga) kuulub Euraasia metsaprovinci Kirde-Euroopa tamme-ringkonda arvatavasse Ida-Balti piirkonda (*districtus balticus orientalis*), on tema lokaalne taimegeograafiline jaotus üldjoontes järgmine. Saared koos mereäärse ribaga Paldiskist Lindi külani Pärnumaal moodustavad saarte alapiirkonna (*subdistrictus insularis*), kuhu kuuluvad viis valdkonda: Saaremaa, Hiiu, Muhu, Vormsi ja Läänerranniku valdkonnad. Mere pehmenav mõju kliimale on eriti tunduv. Et siin pealegi valitsevad „soojad“ lubjarikkad mullaliigid (rühkmullad), siis on taimestik liikiderohke, mis tingitud osalt ka mitmesuguste merega seotud taimede esinemisest. Sellele alapiirkonnale eriti iseloomulikud on: *Anacamptis pyramidalis*, *Artemisia maritima*, *A. rupestris*, *Ajuga pyramidalis*, *Cardamine hirsuta*, *Cephalanthera longifolia*, *Cochlearia danica*, *Geranium lucidum*, *Hedera helix*, *Hydrocotyle vulgaris*, *Hypericum montanum*, *Juncus obtusiflorus*, *Litorea uniflora*, *Ranunculus nemorosus*, *Samolus valerandi*, *Scabiosa columbaria*, *Schoenus nigricans*, *Sorbus aria*, *Teucrium scordium*, *Tetragonolobus siliquosus*, *Veronica hederifolia*, *Vicia lathyroides* jt. Igatahes on paljud siin nimetatud liikidest ka saarte alapiirkonnas haruldased. Peale nende taimede on rida teisi, mis esinevad küll kohati ka väljaspool saari, kuid on siin siiski sagedamad. Seesugusteks liikideks on näit. *Sorbus scandica*, *Taxus baccata*, *Asperula tinctoria*, *Melampyrum cristatum*, *Ophrys muscifera*, *Orchis masculus*, *O. militaris*, *Cladium mariscus*.

Siluri alapiirkond (*subdistrictus siluricus*) asetseb läänerranniku valdkonnast (läänepoolsest Läänemaast) idas, kattes tervet Põhja-Eestit ning haarates ka Põhja-Pärnumaad ja Viljandi- ja Tartumaa põhjapoolseid kihelkondi. Ta koosneb kolmest valdkonnast: Alam-Eesti valdkond (*Estonia inferior*), läänepoolne madalik koos madalama alaga põhjarannikul (Põhja-Pärnumaa ja Läänemaa peale eelmisse alapiirkonda kuuluva rannariba, ja peam. Loode-Harjumaa); ida poole järgneb Ülem-Eesti valdkond (*Estonia superior*, kuhu kuulub ülejäänud osa Harjumaast, Järvamaa pea terveni ja Lääne-Virumaa) ja ida-

poolsemana Alutaguse valdkond (*Allentakia*, Ida-Virumaa). Kuigi sellel suurel maa-alal mullastik on küllalt mitmekesine, valitsevad siin siiski rühkmullad. Peamiselt mullastikust ongi tingitud teatav sugulus saarte ja siluri alapiirkondade vahel. Ainult viimases esinevad meil siiski näit. *Cerastium alpinum*, *Saussurea alpina*, *Saxifraga adscendens*. Peale nende lubjalembeste (kaltsiifilsete) taimede on iseloomulik paljude teiste lubjarikast aluspinda eelistavate taimede sageli hulgaline esinemine, eriti Alam-Eesti valdkonnas. Siin on seesugustest harilikud *Carex montana*, *Filipendula hexapetala*, *Asperula tinctoria*, *Myrica gale* jne. Seevastu on Ülem-Eesti ja Alutaguse valdkond juba märksa vaesemad lubjalembeste liikide poolest. Iseloomulik on neile ka paljude idast Eestisse tunginud taimede ilmumine, nagu *Dracocephalum Ruyschiana*, *Sempervivum soboliferum*, *Moehringia lateriflora*, *Carex laevirostris* jt.

Kolmas, devoni alapiirkond (*subdistrictus devonicus*), kuhu kuulub Lõuna-Eesti, jaguneb viieks valdkonnaks. Esimene neist, Hääde meeste v. (*Regio heademeesteensis*, samanimelise kihelkonna järele), on liivaluidete ja randniitude valdkond Pärnu lahe ümber. Ta ulatub õige kitsa ribana lõunasse üle Läti piiri. Metsades valitseb siin mänd ning iseloomulik on peale mitmesuguste liivataimede rohkuse ka mereäärsete soolakutaimede (halofüütide) esinemine. Teises, Saarde valdkonnas (*Regio saardeensis*, samanim. khk. j.), mida läbib Pärnu jõgi ühes sellesse suubuva Navesti ja Halliste jõega, valitsevad ulatuselt suured rabad ja kuuse-segametsad enamikus lodumetsa iseloomuga. On tähelepanuväärt mitme idaelemendi esinemine üksikuil leiukohtadel, nagu *Cinna latifolia*, *Conioselinum Fischeri*, *Asperula rivalis*.

Kolmas ja neljas, Viljandi (*Regio fellinensis*) ja Tartu (*Regio tartuensis*) valdkond (piir nende vahel käib ligikaudu põhja-lõuna suunas üle Võrtsjärve), on palju tihedamalt asustatud, sest siin on aluspinnaks enamasti savirikkad mullaliigid (Setumaal ja Võrtsjärve ümbruses ka liivmullad). Alutaguse valdkonna kirdeosa ning Tartu valdkonna idaosa piirduvad devoni alapiirkonda kuuluvale viiendale, Peipsi valdkonnale (*Regio peipsiensis*), mille piirid on alles selgitamisel. Viimasel ei puudu ühiseid jooni Hääde meeste valdkonnaga, sest et siin samuti on mõõtuandvad liivtaimed ja leidub ühiseid iseloomulikke liike, nagu *Elymus arenarius*, *Festuca polesica* jne. Samuti

valitseb siin metsades mänd. — Taimogeograafiliselt on nendele valdkondadele iseloomulikud mitmed ida-päritoluga liigid, nagu *Swertia perennis*, *Ligularia sibirica*, *Betula humilis*, *Scolochloa festucacea*, *Gypsophila fastigiata*, *Sempervivum soboliferum*, *Silene chlorantha*, *Bidens radiatus*, *Carex pediformis* (kirdes) jt.

The Estonian Republic has an area of 47,549 km². Bordering on the sea in the west and north, it adjoins Soviet Russia in the east, and Lettonia in the south. In the north it reaches 59°49' (the islet Vaindloo or Stenskär), in the south 57°31', in the west 21°46' (SW of Vilsandi), in the east 28°21'.

Estonia also comprises a number of islands of various dimensions in the Gulf of Finland and that of Riga. Of these, the following are the largest: Saaremaa (2710 km²), Hiiumaa (965 km²), Muhu (204 km²), Vormsi (93 km²). The number of lakes and lakelets is also considerable, with an area of 2320 km². The largest lake — the Peipsi — is divided by the boundary line, and of its total area of 3583 km², 1813 km² belong to Estonia. The Võrtsjärv comes next with its 284.5 km². The largest of all Estonian rivers is the Narva, followed by the Suur-Emajõgi, the Pärnu River and the Kasari River.

The average height of the Estonian territory is 50 m above the sea-level; approximately $\frac{1}{6}$ of the area of the western coast and the islands lies 0—20 m above the sea-level. In various places of the northern coast, at the base of limestone cliffs there occur similar low shores. In the interior of the country there are four hilly regions higher than 100 m: in the western part of Virumaa the hills of *Pandivere* (the highest point being the Emumägi, 166 m); west of the Võrtsjärv the relatively lowest hills, the hills of *Viljandi* or *Sakala* (their highest points being Rutu Mägi, 147 m, and Sürgavere Mägi, 128 m); SE of the Võrtsjärv the hills of *Otepää* (Kuutsemägi, 217 m), and still more to the south-east the relatively highest, the *Haanja* hills, whose highest point is Suur Munamägi — 316 m.

These hills are morainal deposits formed by the accumulating activity of inland ice. Here the ground is not only higher but also more varied than the plains of western and northern Estonia.

Geologically, Northern Estonia, including the islands, belongs to the ordovician and silurian systems with limestone rock and

dolomites in the upper layers of the bottom plain. As Northern Estonia has little moraine cover, and in places none at all, the limestone layers reach the surface, forming here and there alvars. South Estonia, beginning with Middle-Pärnumaa, the northern parts of Viljandimaa and Tartumaa, belongs to the Devonian District, where the underground, which is overlaid by a deep morainal cover, is formed by the Old Red of Middle Devon.

The degree of calciferousness of the bottom plain, which differs very greatly in the north and south, determines the edaphical phytogeographical boundary between North and South Estonia (Fr. Schmidt 1855).

As for her climate, Estonia belongs to the subcontinental transitional area between the climates of Western and Eastern Europe: the difference between the temperatures in the eastern and the western parts is quite considerable. The yearly average temperature is $6,0^{\circ}$ in Vilsandi, $4,5^{\circ}$ in Tartu, $4,6^{\circ}$ C. in Narva-Jõesuu; the lowest temperature occurs in February with averages of $-3,1^{\circ}$, $-6,6^{\circ}$ and $-7,1^{\circ}$ respectively. The temperature of the warmest month, July, is more constant, viz. $16,4^{\circ}$, $17,0^{\circ}$, and $17,4^{\circ}$. The influence of the sea is particularly noticeable in the long and warm autumn of the islands. The corresponding averages are:

in November: $3,1^{\circ}$ — $0,5^{\circ}$ and $0,0^{\circ}$, and

in December: $-0,6^{\circ}$ — $4,9^{\circ}$ „ — $4,6^{\circ}$.

Naturally the differences in temperature are of fundamental importance for the vegetation, and the climatic factors of great moment for the phytogeographical classification of the territory despite the limited dimensions of the area. The vicinity of the sea leads to the retardation of the winter minimum and the summer maximum. The delay as compared with the interior of the country is no less than two weeks, or, in other words, the development of the spring aspect of the vegetation begins on the western islands two weeks later than in the eastern parts of Estonia.

The annual precipitation is from 400 mm (Muhu) to 636 mm (Narva-Jõesuu) and is less on the islands than in the inland.

As the Baltic Sea is connected with the ocean only by the narrow Danish Straits and as in it disembogue a number of large streams and many smaller rivers, the salt percentage of water is much lower than in oceans and other seas. While

the average percentage of salt in oceans is 3,5 ‰, it is 1,6 ‰ in the western part of the Baltic, being still less along the coasts of Estonia, e. g.,

0,4 ‰	in the Bay of Narva
0,6 ‰	„ „ „ „ Tallinna
0,7 ‰	„ „ „ „ Haapsalu
0,7 ‰	near the island of Vilsandi
0,6 ‰	in the Bay of Pärnu
0,2 ‰	„ „ „ „ Matsalu.

The salt percentage of deeper water is higher, but generally this does not affect plants. In spite of the low salt percentage in the sea-water, the halophytic vegetation is sufficiently developed on the western shores of Estonia, because the concentration of the salt in the soils of the seacoast itself is often considerably higher than in the sea-water on account of evaporation.

The flora of Estonia as well as of the neighbouring countries is comparatively young and began to develop only after the glacial period. Since the arctic period (about 10.700 years ago), various climatic periods have obtained in our country. This eventful past has enabled different plants to immigrate at different periods, which process was facilitated by the geographical position of Estonia on the coast of the Baltic Sea, on the western margin of the large Eurasian continent. Hence it is quite natural that in Estonia various West-European plants reach their eastern limit of distribution, whereas a number of eastern continental elements attain their western limit. To the first-named group belong *Hedera helix*, *Hydrocotyle vulgaris*, *Myrica gale*, and others. The second group includes *Chamaedaphne calyculata*, *Scolochloa festucacea*, *Carex laevirostris*, *Moehringia lateriflora*, and others.

All these factors make the flora of Estonia very varied and rich in species. The number of Phanerogams and Pteridophyta is above 1100, which number does not comprize the *Alchemilla*, *Melampyrum*, *Taraxacum* and *Hieracium* species. Especially the islands abound in species. The area of Saare- and Muhumaa is only $\frac{1}{16}$ of the whole territory of Estonia, but their flora contains $\frac{4}{5}$ of the total number of our species.

The foundations for Estonian phytogeographical research have been laid by the works of Fr. Schmidt, K. R. Kupffer,

T. Lippmaa, and P. W. Thomson, who have roughly determined the phytogeographical division of the whole area; on the other hand, the limits of the landscapes require further investigation.

Belonging (with Lettonia) to the East-Baltic District (*districtus balticus orientalis*) of the N. E. European Quercus Region of the Eurasian Forest Province, the Estonian local phytogeographical division is in its main outlines as follows: The islands with the coastal zone from Paldiski to Lindi village in Pärnumaa form the subdistrict of islands (*subdistrictus insularis*), which is divided into five landscapes: the landscape of Saaremaa (Ösel), Hiiumaa (Dagö), Muhumaa (Moon), Vormsi and of the western coast of Läänemaa. The softening influence of the sea on the climate is here especially strongly marked. And since „warm“ limy soil types (richsoils) predominate here, the flora is rich in species, the number of the latter being increased to some extent by the halophytes of the seacoast. This subdistrict is particularly characterized by the following species: *Anacamptis pyramidalis*, *Artemisia maritima*, *A. rupestris*, *Ajuga pyramidalis*, *Cardamine hirsuta*, *Cephalanthera longifolia*, *Cochlearia danica*, *Geranium lucidum*, *Hedera helix*, *Hydrocotyle vulgaris*, *Hypericum montanum*, *Juncus obtusiflorus*, *Litorea uniflora*, *Ranunculus nemorosus*, *Samolus valerandi*, *Scabiosa columbaria*, *Schoenus nigricans*, *Sorbus aria*, *Teucrium scordium*, *Tetragonolobus siliquosus*, *Veronica hederifolia*, *Vicia lathyroides*, and others. Some of the species here mentioned are doubtless rare also in the subdistrict of islands. In addition to these plants there are a number of species which are sometimes found elsewhere but are more frequent on the islands, e. g. the following: *Sorbus scandica*, *Taxus baccata*, *Asperula tinctoria*, *Melampyrum cristatum*, *Ophrys muscifera*, *Orchis masculus*, *O. militaris*, *Cladium mariscus*.

The Silurian Subdistrict (*subdistrictus siluricus*) is situated east of the landscape of the western shore of Läänemaa, covering the whole North of Estonia and the northern part of Pärnumaa, as well as the northern parishes of Viljandimaa and Tartumaa. It is composed of three landscapes: the landscape of Alam Eesti (*Estonia inferior*), the western lowland together with the lower part of the northern coast (North Pärnumaa and Läänemaa, except the coastal zone which belongs to the afore-

mentioned subdistrict, and the greater part of NW Harjumaa); further to the east comes the landscape of Ülem-Eesti (*Estonia superior*), to which belong the remaining part of Harjumaa, nearly the whole of Järvamaa, the western part of Virumaa, and, in the extreme East, the landscape of Alutaguse (*Allentakia*, East Virumaa). Although the soil on this large area is heterogenous enough, richsoils predominate. Mainly on this account there is a certain affinity between the subdistrict of islands and the Silurian subdistrict. Only in the latter are found, *e. g.*, *Cerastium alpinum*, *Saussurea alpina*, *Saxifraga adscendens*. A feature as characteristic as these calciphilous plants is the plentiful occurrence of many other plants which prefer limy soil, especially in the landscape of Alam-Eesti. Thus, *Carex montana*, *Filipendula hexapetala*, *Asperula tinctoria*, *Myrica gale*, and others are very common in the latter. On the contrary, the landscapes of Ülem-Eesti and Alutaguse are considerably poorer in calciphilous species. A further characteristic of the latter landscapes is the appearance of a great many plants which have advanced into Estonia from the east, such as *Dracocephalum Ruyschiana*, *Sempervivum soboliferum*, *Moehringia lateriflora*, *Carex laevirostris*, and others.

The third, the Devonian Subdistrict, which comprises Southern Estonia, is divided into 5 landscapes. The first of them — the landscape of Häädemeeste (*Regio heademeesteensis* after the parish of the same name) — is the landscape of dunes and salt meadows surrounding the Bay of Pärnu. In the south it extends as a narrow zone beyond the Estonian boundary, into Lettonia. In the woods of that region the pine-tree predominates. The great number of sand-plants and the occurrence of halophytes are likewise characteristic features. In the second landscape — that of Saarde (named after the parish of the same name), with the Pärnu River and the Navesti and Halliste Rivers — there are great bogs and fir-mixed woods, mostly of a marshy character. A remarkable characteristic is the occurrence of various eastern elements on isolated habitats, *e. g.* of *Cinna latifolia*, *Conioselinum Fischeri*, *Asperula rivalis*.

The third and fourth landscapes — those of Viljandi (*Regio fellinensis*) and Tartu (*Regio tartuensis*), the boundary between which passes approximately from the north to the south across the lake Võrtsjärv — are more densely populated owing to

the clayey nature of the underground, which, however, becomes sandy in Setumaa and in places also near the Vörtsjärv. The north-eastern part of the landscape of Alutaguse and the eastern part of the landscape of Tartu border on the fifth, the landscape of Peipsi (*regio peipsiensis*), the limits of which are still undetermined. The latter shares certain traits with the landscape of Häädemeeste, both being characterized by the occurrence of distinctive sandplants as well as of certain characteristic species, such as *Elymus arenarius*, *Festuca polesica*, etc. The chief feature of the woods is the pinetree. A typical phytogeographical feature of these landscapes is the appearance of various eastern elements, e. g. of *Swertia perennis*, *Ligularia sibirica*, *Betula humilis*, *Scolochloa festucacea*, *Gypsophila fastigiata*, *Sempervivum soboliferum*, *Silene chlorantha*, *Bidens radiatus*, *Carex pediformis* (in the N. E.), and others.

The work „Flora exsiccata Liv-, Est- und Curlands“, which was begun by prof. A. v. Bunge in the middle of last century, contained much material from Estonia, but has nowadays become a great rarity. While undertaking the publication of its new series „Eesti Taimed“ („Estonian Plants“), the Botanical Museum is quite aware of the difficulties connected with this enterprise, seeing that there are as yet great gaps in Estonian botanical research, the floristic data for certain districts being deficient and phytosociological investigations few. Over and above the systematical and floristical aspects, the Museum intends to emphasize also the phytosociological and phytogeographical character of the species. In order to illustrate the latter, the distribution sketches of various characteristic species are given, even though these sketches for obvious reasons cannot claim to be definitive.

The venture of the Botanical Museum has met with much interest both among specialists and in larger circles, so that in compiling its first map the Museum has had the advantage of the assistance of many persons (cf. the Estonian text). Especially the kind collaboration of prof. K. R. Kupffer, Mr. Th. Nenjukov and Dr. P. W. Thomson has to be acknowledged with much gratitude.

Select Bibliography.

- [For further bibliography see Kupffer (1925), Lehmann (1895) and „Eesti Entsüklopeedia“ vol. II (1933).]
- Kupffer, K. R., Grundzüge der Pflanzengeographie des Ostbaltischen Gebietes. — Abh. d. Herder-Instituts I, 6, Riga 1925.
- Lehmann, Ed., Flora von Polnisch-Livland mit besonderer Berücksichtigung der Florengebiete Nordwestrusslands, des Ostbaltikums, der Gouvernements Pskow und St.-Petersburg, sowie der Verbreitung der Pflanzen durch Eisenbahnen. — Archiv f. d. Naturk. Liv-, Est- und Kurlands, 2. Serie, Bd. XI, 1, Dorpat 1895.
- „ Nachtrag (I) zur Flora von Polnisch-Livland etc. Ibid. XI, 2, Dorpat 1896.
- Lippmaa, T., Beiträge zur Kenntnis der Flora und Vegetation Südwest-Estlands. — Acta Inst. et Horti botanici Universitatis Tartuensis (Dorpatensis) vol. II, fasc. 3—4, Tartu 1932.
- Schmidt, Fr., Flora des silurischen Bodens von Estland, Nord-Livland und Oesel. — Arch. f. d. Naturk. Liv-, Est- u. Kurl., 2. Serie, Bd. I, 3, Dorpat 1855.
- Wiedemann, F. J. und Weber, E., Beschreibung der phanerogamischen Gewächse Est-, Liv- und Kurlands, Reval 1852.
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1. *Selaginella selaginoides* (L.) Link. — *Selaginella*.

Senini harva Loode-Eestis ja saartel *Schoenus ferrugineus-Pinguicula* ühingus ja *Trichophorum alpinum-Drosera anglica* ühingus mätastel.

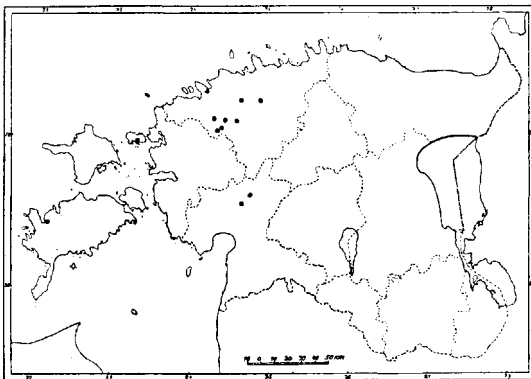
Saaremaa, Kihelkonna, Pidula lahe kagusopi juures oleval alliksool, mätastel. Saatjad (Companions): *Drosera anglica*, *D. rotundifolia*, *Equisetum variegatum*, *Schoenus ferrugineus*, *Centaureum erythraea*.

Up till now rare in N. W. Estonia and on the islands. In the *Schoenus ferrugineus-Pinguicula* association and the *Trichophorum alpinum-Drosera anglica* association on tussocks.

Saaremaa, parish of Kihelkonna, on well-ground swamp near bay Pidula, on tussocks.

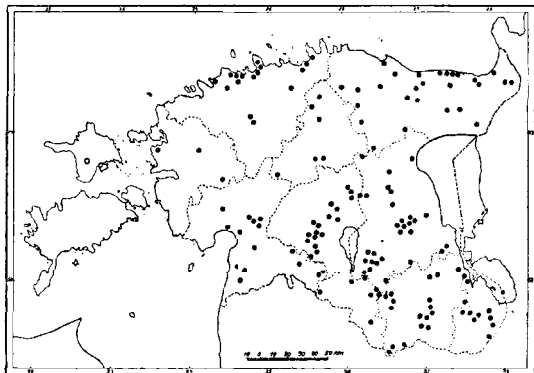
4. VIII. 1931.

leg. K. Eichwald.



2. *Asarum europaeum* Linné. — *Metspipar*.

Varjurikastes, neutraalse huumusega leht- ja segametsades; näib haruldane Lääne- ja Pärnumaa rannapoolsemates osades (vrd. T. Lippmaa, Beitr. z. Kenntn. d. Fl. u. Veget. Südwestlands, 1932); Hiiumaalt üks teade (tõenduseksemplarita); kuulub *Hepatica-Pulmonaria* ühingu karakterliikide hulka.



Tartu ligidal, Vasula järvest läänes, segametsas. Saatjad (Companions): *Hepatica triloba*, *Oxalis acetosella*, *Stellaria holostea*, *Anemone ranunculoides* jt.

In shadowy, deciduous and mixed woods with neutral humus; not found (?) on the islands and apparently rare in the littoral parts of Lääne- and Pärnumaa. (Compare T. Lippmaa, Beiträge z. Kenntnis d. Fl. u.

Veget. Südw.-Estlands, 1932). Belongs to the characteristic species of the *Hepatica-Pulmonaria* association.

Near T a r t u, west of lake Vasula, in mixed wood.

23. V. 1930.

leg. V. Sirgo.

3. *Trollius europaeus* Linné. — Kullerkupp.

Tervel Eesti alal, haruldasem saartel. Harilik *Scorzonera humilis-Melampyrum nemorosum*'i üh. Selle ühingu *Trollius*'e rikka teisendi karaktertaim. Esineb ka teistes niidu ühingutes, eriti puisniitudel.

V õ r u m a a, P õ l v a khk., Võhandu jõe ääres niiskel heinamaal, Võru ligidal.

Over the whole territory of Estonia, less frequent on the islands. Common in the *Scorzonera humilis-Melampyrum nemorosum* association. The characteristic species of the *Trollius*-variant of this association. To be found in other meadow-associations, especially in woody meadows.

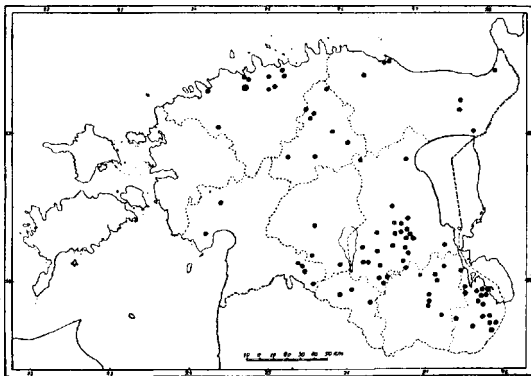
V õ r u m a a, parish of P õ l v a, not far from Võru, in a moist meadow near the river Võhandu.

13. VI. 1927.

leg. W. J. Reinthal.

4. *Saxifraga hirculus* Linné. — Kollane kivirik.

Esitatud materjal on var. *typica* Hook. f., mille mõlemad Euroopas esinevad vormid, f. *major* Engl. et Irmsch. (20 sm ja kõrgem) ja f. *intermedia* Engl. et Irmsch. (alla 20 sm) on üleminekutega ja raskesti piiriteldavad, nagu käesolevalgi juhul; enamik kaldub siiski viimase vormi poole.



Eesti saarte floorast puuduvad *S. hirculus*'e üle kindlad andmed, ta pealevimisalaks on mandri idapool, kus esineb enam-vähem rabastunud soodes koos *Sagina nodosa*, *Parnassia pa-*

lustris, *Oxycoccus palustris*, *Drosera anglica*, *Carex dioica*, *Trichophorum alpinum* ja teistega, eriti *Trichophorum alpinum-Drosera anglica* ühingus.

T a r t u m a a, Elva lähedal Verevi järve äärsel rabastunud niidul turba-aukude juures. Saatjad (Companions): *Caltha palustris*, *Parnassia palustris*, *Eriophorum angustifolium*.

The material at hand is var. *typica* Hook. f., of which two forms occur in Europe, viz. f. *major* Engl. et Irmsch. (20 cm and more) and f. *intermedia* Engl. et Irmsch. (less than 20 cm). These forms are difficult to delimit, as also in the present case. The elements of the latter form, however, appear to predominate.

Data as to the occurrence of *Saxifraga hirculus* on the Estonian islands are wanting. Its main distribution area is the eastern part of our territory where it occurs here and there in more or less boggy swamps together with *Sagina nodosa*, *Parnassia palustris*, *Oxycoccus palustris*, *Drosera anglica*, *Carex dioica*, *Trichophorum alpinum* and others, especially in the *Trichophorum alpinum-Drosera anglica* association.

T a r t u m a a, neighbourhood of Elva near Lake Verevi, in a boggy meadow.

10. IX. 1930.

leg. T. Lippmaa.

4-a. *Saxifraga hirculus* Linné. — Kollane kivirik.

T a r t u, Ropka asundusest 2 km idas, Emajõe lühaheinamaal. Saatjad (Companions): *Salix rosmarinifolia*, *Parnassia palustris*, *Epilobium palustre*, *Carex limosa*, *Comarum palustre*, *Pedicularis palustris*.

T a r t u, 2 km east of Ropka, in a meadow near the Emajõgi.

14. IX. 1930.

leg. H. Salasoo.

5. *Medicago falcata* Linné. — Spirlutsern.

(*M. sativa* β. *falcata* Döll, Urban.)

Peam. Põhja-Eestis ja saartel, pillatult ja pea eranditult kultuurist väga mõjustatud paikades: kuivadel niitudel, teede ääres, põllupeenardel, nõlvadel.

V i r u m a a, R a k v e r e ligidal Aluvere kivimurrus Kunda raudtee ääres, hulgi.

Mainly in northern Estonia and on the islands, sporadically, and almost without exception on tracts very much influenced by culture: in dry meadows, along roadsides, on hillsides, along fields.

V i r u m a a, near R a k v e r e, in the quarry of Aluvere near the railroad of Kunda, abundantly.

13. VIII. 1930.

leg. G. Mechmershausen.

6. *Linum catharticum* Linné. — Aaslina.

Tervel alal väga harilik. Esineb õige mitmesugustes niiduühingutes (kuivad looühingud, niiduühingud liiva- või savialuspinnaga, kohati koguni halofiilne *Juncus Gerardi* ühing).

S a a r e m a a, K i h e l k o n n a, Kuusnõmme Bioloogiajaama lähedal karjamaal.

Very common throughout the whole area. Occurs in various meadow associations (dry alvar associations, meadow associations on sandy or clayey subsoil, here and there even in the *Juncus Gerardi* association).

S a a r e m a a, parish of K i h e l k o n n a, near the Biological Station of Kuusnõmme, on pasture-land.

8. VII. 1932.

leg. Juta Rebane.

7. *Polygala amarellum* Crantz. — Mõru vahulill.

Tervel alal harilik niitudel ja puisniitudel mitmesugustes ühingutes.

V õ r u m a a, P õ l v a k h k., Võhandu jõe äärsel niiskel niidul Võru lig.

Common throughout the whole area in meadows and woody meadows in various associations.

V õ r u m a a, parish of P õ l v a, in a moist meadow along the river Võhandu, near Võru.

12. VI. 1927.

leg. W. J. Reinthal.

8. *Tilia cordata* Miller. — Harilik pärn.

Harilikum Edela-Eestis (ühes saartega) ning põhjarannikul paekalda all metsades sageli koos teiste lehtpuudega nagu saar, vaher, jalakas jt. (*Ulmus-Acer-Tilia* üh.). Harva ning peam. põõsakujulisena ka lodudes. Väga sagedasti ilupuuna teede ääres, õuedel ja parkides.

H a r j u m a a, J ü r i k h k., kiriku ligidal tammikus.

More frequent in S. W. Estonia (including the islands) and in the deciduous woods at the base of the limestone cliffs of the northern coast (in the *Ulmus-Acer-Tilia* association). Rarely also in marshes, mainly in bush form. Very often as an ornamental tree along roadsides, in parks and yards.

H a r j u m a a, parish of J ü r i, in an oakwood near the church.

17. VIII. 1930.

leg. Th. Nenjukov.

9. *Sanicula europaea* Linné. — Metsputk.

Kohati varjulistes leht- ja segametsades niiskel, toiteainete-rikkal pinnasel *Hepatica-triloba-Pulmonaria officinalis*'e ühingus. Sagedam Loode-Eestis ühes saartega, teisel puudub kohati laiemal alal.

S a a r e m a a, lehtmetsas A b r u k a saarel, metsavahi maja lähedal, hulgi.

Sporadically in shadowy deciduous and mixed woods on moist, rich soil in the *Hepatica triloba-Pulmonaria officinalis* association. It is more frequently to be found in N. W. Estonia and on the islands, while elsewhere it is sometimes missing on larger areas.

S a a r e m a a, in deciduous wood on the isle of A b r u k a, near the forester's house, abundantly.

1. VII. 1931.

leg. T. Lippmaa.

10. *Primula veris* L. em. Hudson. — Nurmenukk, kikkapüks.

[*P. officinalis* (L.) Hill.]

Kuivadel aruheinamaadel, nõlvadel, kohati hulgi eriti *Scorzonera humilis-Melampyrum nemorosum*'i ühingu *Primula officinalis*'e teisendis.

Võrumaa, Rõuge khk., Kasaritsa Otkamäe rohusel nõlval.

In dry hay-fields, on hillsides, here and there abundantly, especially in the *Primula officinalis* variant of the *Scorzonera humilis-Melampyrum nemorosum* association.

Võrumaa, parish of Rõuge, on a grassy hillside of Otkamäe.

1. VI. 1927.

leg. W. J. Reinthal.

11. *Primula farinosa* L. var. *genuina* C. Koch. --

Pääsukesesilm, jaanilill.

Eesti materjal on tüüpiline var. *genuina* C. Koch [in Linn. XVII, p. 307 (1843)]; Pax'i subsp. *eufarinosa* var. *genuina* [Pax in Engler, Bot. Jahrb. X, p. 199 (1899)]; Pax u. Knuth in Engler, Pflanzenreich, H. 22 (IV, 237), p. 83 (1905)] alla kuuluvad ka vormid kollase jahukattega, milliseid Eestis ei leidu [vrd. N. Busch, Fl. Sibiriae et Orientis extremi, fasc. IV, p. 41, 42 (1926)].

Kõikjal märgadel niitudel ja puisniitudel, hulgalisem Kesk- ja eriti Lääne-Eestis, *Sesleria coerulea-Primula farinosa* ühingu karaktertaim. Idapoolne levimispiir on väljaspool Eesti territooriumi, Leningradi ja Pihkva kub.

Võrumaa, Põlva khk., niiskel niidul Väimela juures Võru ligidal.

The material of Estonia is the typical var. *genuina* C. Koch [in Linn. XVII, p. 307 (1843)]; the subsp. *eufarinosa* Pax var. *genuina* [Pax in Engler, Bot. Jahrb. X, p. 199 (1899)]; Pax u. Knuth in Engler, Pflanzenreich, H. 22 (IV, 237), p. 83 (1905)] contains also forms with leaves, which are yellow-mealy beneath. These forms are not found in Estonia [comp. N. Busch, Fl. Sibiriae et Orientis extremi, fasc. IV, p. 41, 42 (1926)].

Everywhere in moist meadows and woody meadows, more abundant in central and western Estonia; the characteristic species of the *Sesleria coerulea-Primula farinosa* association. The eastern limit of distribution is outside the territory of Estonia, in the provinces of Leningrad and Pskov.

Võrumaa, parish of Põlva, in a moist meadow near Väimela, neighbourhood of Võru.

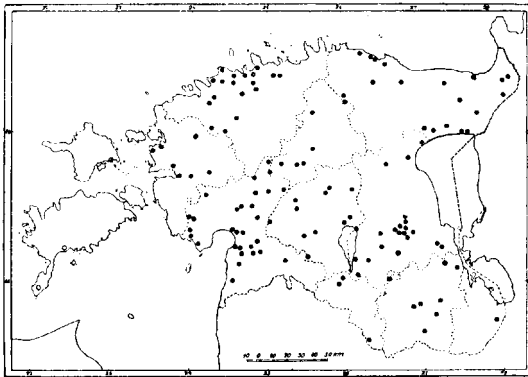
20. VI. 1927.

leg. W. J. Reinthal.

12. *Hottonia palustris* Linné. — Vesisulg.

Seisvas ja aeglaselt voolavas vees kravides ja ojades. Harvem lääneosas. Saare- ja Hiiumaalt teateid kolmest kohast (tõenduseks emplarideta).

Tartumaa, Tartu ligidal Vasula järvest 1 km kagus, kraavis.



Saatjad (Companions):
Carex vesicaria, *C. rostrata*, *Alisma plantago*.

In stagnant and sluggish water, ditches and brooks. Less often in the western part of the territory. The data from Saare- and Hiiumaa need verification.

Tartumaa 1 km S. E. of lake Vasula near Tartu, in a ditch.

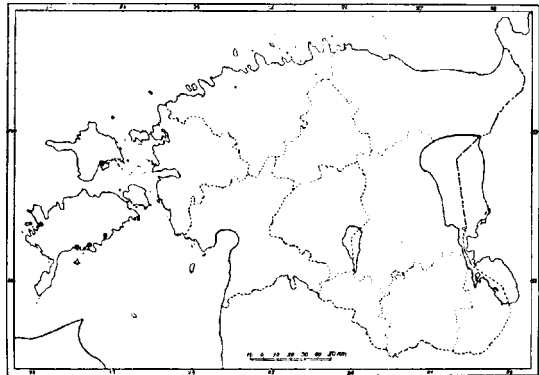
leg. V. Sirgo.

28. V. 1930.

13. *Samolus valerandi* Linné. — Randpung.

Senini leitud Saaremaal ja Hiiumaa lõunarannikul, salineses vöös lubjasel mudal, peam. avaihinguis vähemate kogumikkudena. Saatjateks on *Triglochin maritima*, *Aster tripolium*, *Phragmites communis*, *Scirpus maritimus*.

Antud leiukohalt esmakordselt a. 1824 (A. v. Bunge); on siin püsinud sellele vaatamata, et teda läinud sajandi keskpaigas ei leitud ja et see osa rannast on karjamaa. Taimed on sageli loomadest puretud, kuid mitte eelistatavad.



Saaremaa, Püha khk., Kasti asund. ligidal mererannal.

Up till now found on the southern coasts of Saaremaa and Hiiumaa, in the saline belt on limy mud; in smaller colonies, mainly in associations with open growth. Accompanied by *Triglochin maritima*, *Aster tripolium*, *Phragmites communis*, *Scirpus maritimus*.

For the first time reported to be seen there in 1824 (Bunge); has persisted there, though it was not found in the middle of last century and though this part of the coast is used as pasture. The plants are often nibbled, but not very much liked, by cattle.

Saaremaa, parish of Püha, near Kasti on the coast.

5. VII. 1930.

leg. K. Eichwald.

14. *Armeria vulgaris* Willdenow. — Merikann.

[*Statice armeria* L. var. *elongata* (Hoffm.) DC.]

Liivastel aladel peam. Põhja-Eestis mereranna läheduses, teisel harva, koos liivataimedega nagu *Festuca ovina*, *Thymus serpyllum*, *Sedum acre*, *Hieracium pilosella*, *Veronica spicata* jt. Madalamatel, kevadel üleujutatud niitudel puudub *Armeria* ka aladel, kus ta kõrge-
mal harilik.

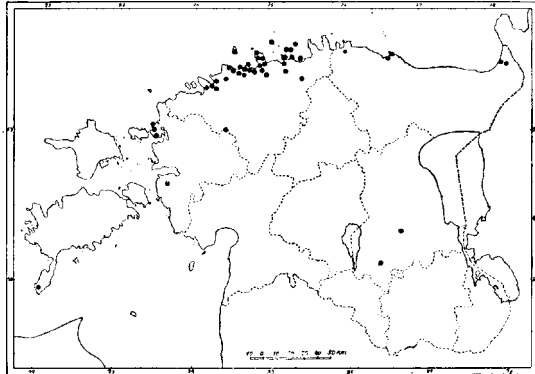
Tallinna, Rocca al Mare, rannal.

On sandy grounds, mainly in northern Estonia in the vicinity of the sea-shore, elsewhere rare; occurs along with sand-plants, such as *Festuca ovina*, *Thymus serpyllum*, *Sedum acre*, *Hieracium pilosella*, *Veronica spicata*, and others. In lower meadows that are submerged in spring, *Armeria* is not found even in those districts where it is common on higher ground.

Tallinna, Rocca al Mare, on the sea-coast.

25. VII. 1931.

leg. A. Üksip.



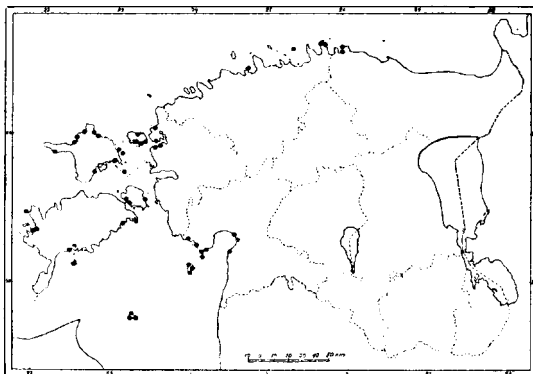
15. *Centaurium pulchellum* (Swartz) Druce. — Väike maasapp.

(*Erythraea pulchella* Fries.)

Mererannal, haril. *Centaurium erythraea*'ga koos *Juncus Gerardi* ühin-
gus randniitudel, kuid üldiselt haruldasem. Esitatud taimede enamik vas-
tab hästi selle liigi vormile *palustre* (Gaud.) Schinz et Keller (= var. *simpli-*

cissimum (Schmidt) Fr. Zimmerm.), milline vorm osutub Eesti rannikutel tavalisemaks; harunenud eksemplaridel ei toimu harunemine pea millalgi otse juurekaelast, nagu kirjeldatakse tüüpilist *C. pulchellum*'it, vaid alles teisest kuni kolmandast internodiumist peale.

Saaremaa, Aburuka saare halofiilsel niidul.



On the sea-coast, usually together with *Centaurium erythraea* in the *Juncus Gerardi* association, in salt meadows, but generally less frequent. The majority of plants in the present case corresponds to the form *palustre* (Gaud.) Schinz et Keller [= var. *simplicissimum* (Schmidt) Fr. Zimmerm.] of this species, which is more common on the Estonian coast. In branched specimens the branching hardly ever takes place at the base as in the typical *C. pulchellum*, but usually at the second or third internode.

Saaremaa, in a salt meadow of the isle of Abrika.

5. VIII. 1931.

leg. T. Lippmaa.

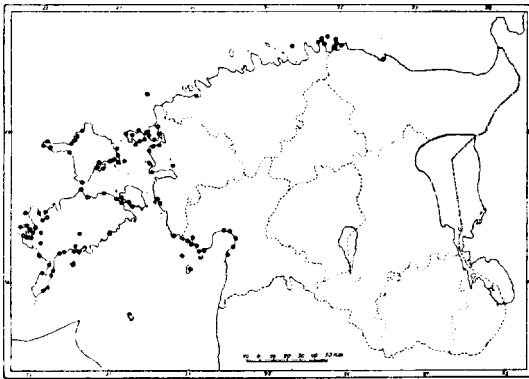
16. *Centaurium erythraea* Rafn. — Linalehine maasapp.

(*Erythraea litoralis* Fries.)

Mererannal avaühinguis ja *Juncus Gerardi* ühingu randniitudel, haril.

hulgi. Eestis üks selle ühingu karakterliikisid.

Saaremaa, Abrika saare halofiilsel niidul.



On the seashore in associations with open growth and in the *Juncus Gerardi* association, usually abundantly. In Estonia it is one of the characteristic species of this association.

Saaremaa, in a salt meadow of the isle of Abrika.

5. VII. 1931.

leg. T. Lippmaa.

16-a. *Centaurium erythraea* Rafn. — Linalehine maasapp.

(*Erythraea litoralis* Fries.)

Saaremaa, Kihelkonna, Kuusnõmme lahe kivisel rannal avaühinguis; saatjad (Companions): *Juncus Gerardi*, *Carex glauca*, *Plantago maritima*, *Glaux maritima*.

Saaremaa, parish of Kihelkonna, on the shingle beach of the Bay of Kuusnõmme in associations with open growth.

10. VII. 1932.

leg. Juta Rebane.

17. *Centaurium umbellatum* Gilibert. — Harilik maasapp.

(*Erythraea centaurium* Persoon.)

Tervel alal pillatult, teede äärtel, nõlvadel; sageli sekundaarses taimkattes (raiesmikkudel, jäätmaadel jne.).

Tartumaa, Elva ja Peedu vahel kesapõldudel ja tee ääres.

Scattered throughout the whole area, along roadsides, on hillsides, often in secondary plant-covering (on clearings, fallow grounds, etc.).

Tartumaa, between Elva and Peedu, in fallow fields and at roadsides.

10. IX. 1930.

leg. T. Lippmaa.

18. *Odontites litoralis* Fries. — Rand-kamaras.

[*O. rubra* Gilib. subsp. *litoralis* (Fries) Hayek.]

Halofiilsetel randniitudel sageli *Juncus Gerardi* ühingus.

Saaremaa, Abruksa saare halofiilsel randniidul, hulgi.

In salt meadows on the sea-coast, frequently in the *Juncus Gerardi* association.

Saaremaa, in a salt meadow of the isle of Abruksa, abundantly.

5. VIII. 1931.

leg. T. Lippmaa.

18-a. *Odontites litoralis* Fries. — Rand-kamaras.

[*O. rubra* Gilib. subsp. *litoralis* (Fries) Hayek.]

Saaremaa, Kihelkonna, Kurgurahu saarekesel Kuusnõmme lahes, *Juncus Gerardi* niidul.

Saaremaa, parish of Kihelkonna, on the islet of Kurgurahu in the Bay of Kuusnõmme, in the *Juncus Gerardi* association in a salt meadow.

16. VII. 1932.

leg. Juta Rebane.

19. *Odontites serotina* (Lam.) Reichenbach. — Sügiskamaras.

[*O. rubra* Gilib. subsp. *serotina* (Lam.) Hayek.]

Liigi (*O. rubra*) sügisrass; niitudel, karjamaadel, jooksvate ja seisvate mageveekogude kallastel jne.

Tartu juures Emajõe kaldal, hulgi.

The autumn-race of the species; in meadows, pastures, on banks of flowing or stagnant fresh-waters, etc.

Near Tartu, on the border of the river Emajõgi, abundantly.

12. IX. 1931.

leg. K. Eichwald.

20. *Litorella uniflora* (L.) Ascherson f. *terrestris* Glück. — Järvikas.

Senini leitud vaid Saaremaa lääneosas, merekalda lähedases madalates, sageli kuivaks jäävates mageveekogudes — „silmaades“, lubjamudai; moodustab tihedaid, polstritaolisi kogumikke laikudena; öitsemine kuivalejäämisel väga rikkalik, ka viljumine rohke.

Saaremaa, Kihelkonna, Kuusnõmme Bioloogiajaama ja Atla vahel mererannal, kõrgemal maksimaalsest mereveeseisust.

Up till now found only in the western part of Saaremaa near the sea-coast, in the lime-mud of shallow fresh-water pools that frequently dry up; forms dense, cushion-like colonies in patches; flowers abundantly when the ground is dried up, fructification likewise rich.

Saaremaa, parish of Kihelkonna, between the Biological Station of Kuusnõmme and Atla, above the high-water limit.

2. VIII. 1931.

leg. K. Eichwald.

21. *Eupatorium cannabinum* Linné. — Vesikanep.

Seisvate ja voolavate vete kallastel, väga sageli hulgi päikesepaistelistes kaldavõsastikkudes.

Tartumaa, Võnnu khk., Emajõe delta Peipsjäärssel rannakünnisel, põõsastes.

Saatjad (Companions): *Salix cinerea*, *Betula humilis*, *Solanum dulcamara*, *Scutellaria galericulata*, *Senecio paludosus*, *Symphytum officinale*, *Achillea cartilaginea*, *Aspidium thelypteris*.

On the banks of stagnant and sluggish waters, very often abundantly in sunny shrubberies along the banks.

Tartumaa, parish of Võnnu, in bushes along the border of Lake Peipsi.

30. VII. 1931.

leg. V. Sirgo.

22. *Trimorpha acris* Vierhapper. — Jaani õnnehein.

(*Erigeron acer* L.)

Tervel alal kuivadel kinkudel, nõlvadel, teede ääres, loopealsetel jne. Tartu ligidal Lohkva küla Kõtsi talu liiva-augu kaldal.

Over the whole area on dry hillocks, hillsides, along roadsides, alvars etc.

Near Tartu, in the village of Lohkva on the bank of a gravel-pit.

24. VI. 1931.

leg. H. Salasoo.

23. *Gnaphalium silvaticum* Linné. — Mets-kassiurb.

Tervel alal kuivades männimetsades, raiesmikkudel, sihtidel, karjamaadel, teede ääres. Apofüüt.

Tartumaa, Kambja khk., kalmistust 0,5 km kagus, metsas asuval legendikul.

Throughout the whole area in dry pinewoods, clearings, lanes cut in the wood, pastures, along roadsides. Apophyte.

Tartumaa, parish of Kambja, 0,5 km S. E. of cemetery on a clearing in a wood.

26. VII. 1930.

leg. H. Salasoo.

24. *Gnaphalium uliginosum* Linné var. *tomentosum* Hoffmann
(= var. *incanum* Neilreich).

Raba-kassiurb.

Tervel alal niisketes paikades: karjamaadel, põldudel, teede ääres, üleujutatavail kaldail jne.

Tartumaa, Kambja khk., kalmistust 0,5 km kagus, metsas asuval põllul.

Over the whole area on moist tracts: in pastures, fields, along roadsides, on flooded banks, etc.

Tartumaa, parish of Kambja, 0,5 km S. E. of cemetery, in a fallow field in a wood.

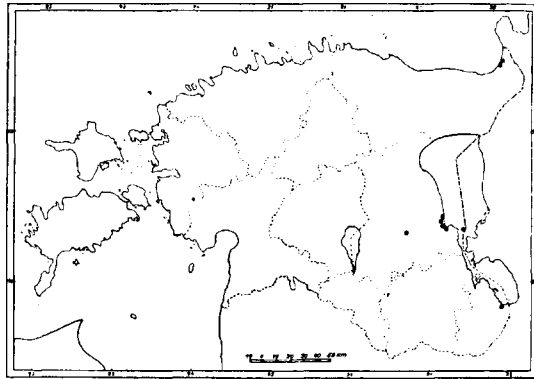
26. VII. 1930.

leg. H. Salasoo.

25. *Bidens radiatus* Thuillier. — Käärjas ruse.

Selle liigi esinemine piirdub mandri idapoolse osaga, kus teda leitud Narva jõe ja Peipsi järve kallastel ning kust ka uusi leide on oodata. Oma läänepoolsemale leiukohale (Tartu juures 1931) on ta nähtavasti Peipsi piirkonnast talutud parvetamisega. *B. radiatus* ei ulatu kõrgemale maksiimaalse veeseisu piirist ja ta arenemine võimaldub alles peale kevadise suurvee langemist; ta esineb vahel omaette hõredate laikudena, enamasti aga avaihinguis liikidega nagu *Rumex maritimus*, *Gnaphalium uliginosum*, *Inula britannica*, *Limosella aquatica* jt.

Peipsi Piirisaar, idakalda üleujutataval alal, kohati rohke.



This species is confined to the eastern part of the territory, being found along the river of Narva and on the borders of Lake Peipsi. Into its western habitat (near Tartu 1931) it has evidently been carried by rafting. *Bidens radiatus* does not extend higher than the highest water level and its development is possible only after the spring high-water has passed. It sometimes occurs in sparse colonies, mostly, however, in associations with open growth, together with such species as *Rumex maritimus*, *Gnaphalium uliginosum*, *Inula britannica*, *Limosella aquatica*, etc.

Lake Peipsi, Piirisaar, on the eastern border which is sometimes flooded, sporadically abundant.

29. VIII. 1931.

leg. K. Eichwald.

25-a. *Bidens radiatus* Thuillier. — Kiirjas ruse.

Tartumaa, Praaga Emajõe suus, sageli üleujutataval madalal, turbasel kaldal. Saatjad: *Bidens tripartitus*, *B. cernuus*, *Polygonum hydropiper*, *Alisma plantago*, *Ranunculus repens*. pH 6,0.

Tartumaa, Praaga, in the mouth of the river Emajõgi, on a low boggy bank which is often inundated. Companions: *Bidens tripartitus*, *B. cernuus*, *Polygonum hydropiper*, *Alisma plantago*, *Ranunculus repens*. pH 6,0.

16. VIII. 1932.

leg. V. Sirgo.

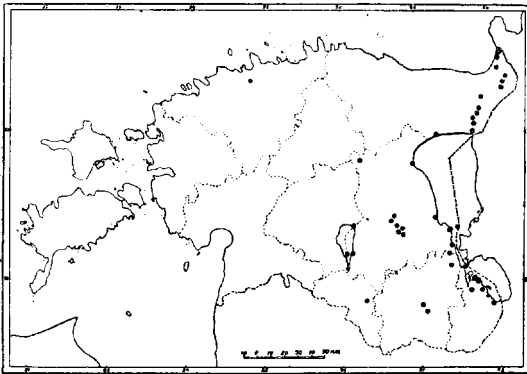
26. *Achillea cartilaginea* Ledebour. — Kõhrhambune raudrohi.

(*A. salicifolia* Besser.)

Kesk- ja Lõuna-Eesti jõgede lammidel mitte haruldane ja sageli hulgi. *Achillea cartilaginea* (*ptarmica*)-*Veronica longifolia* ühingu karaktertaim. Sellele peale nimetatud liikide omased *Thalictrum flavum*, *Veronica teucrium*, *Senecio paludosus* jt. Pärnumaa jõgede lammidel asendab selles ühingu *A. cartilaginea*'t *Achillea ptarmica*.

Tartumaa, Võnnu khk., Emajõe delta, Peipsi-äärne rannakünnis. Saatjad (Companions): *Salix cinerea*, *Betula humilis*, *Solanum dulcamara*, *Senecio paludosus*, *Symphytum officinale*, *Scutellaria galericulata*, *Aspidium thelypteris* jt.

Not infrequently found in central and southern Estonia, on the banks



of rivers, often abundantly. The characteristic species of the *Achillea cartilaginea* (*ptarmica*) - *Veronica longifolia* association. To this association belong, save this species, *Thalictrum flavum*, *Veronica teucrium*, *Senecio paludosus*, and others. In Pärnumaa *Achillea cartilaginea* is replaced in this asso-

ciation by *Achillea ptarmica*.

Tartumaa, parish of Võnnu, near the mouth of the Emajõgi on the banks of Lake Peipsi.

30. VII. 1931.

leg. V. Sirgo.

26-a. *Achillea cartilaginea* Ledebour. — Kõhrhambune raudrohi.

(*A. salicifolia* Besser.)

Tartu, sadamaraudtee ääres Emajõe kaldal, kogumikuna.

Tartu, at the harbour-railway on the bank of the Emajõgi.

20. VIII. 1931.

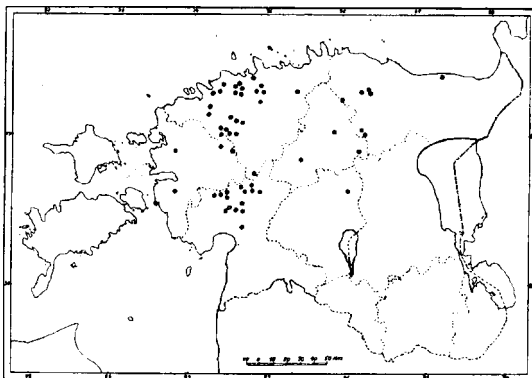
leg. K. Eichwald.

**27. *Saussurea alpina* (L.) De Candolle subsp. *estonica* (Baer)
Kupffer. — **Soojumikas.****

Turbastel niitudel, võsastikkudes, puisniitudel, pealevimine siluri ala keskmises osas — Harju- ja Järvamaal. Esineb Eestis sageli koos *Lonicera coerulea*'ga.

Harjumaa, Hageri khk., kiriku lähedal soisel niidul.

In boggy meadows, shrubberies, woody meadows, mainly in the middle part of the Silurian lime-district, *i. e.* in Harjumaa and Järvamaa. In Estonia often to be found together with *Lonicera coerulea*.



Harjumaa, parish of Hageri, near the church in a swampy meadow.

16. VII. 1921.

leg. **P. W. Thomson.**

**27-a. *Saussurea alpina* (L.) De Candolle subsp. *estonica* (Baer)
Kupffer. — **Soojumikas.****

Järvamaa, Ambla-Kadrina khk. piiril, Tapalt 1,5 km loodes, jõe kaldal võsasel niidul. Saatjad (Companions): *Tofieldia calyculata*, *Lonicera coerulea*, *Viburnum opulus*.

Järvamaa, on the boundary of the parishes of Ambla and Kadrina, 1,5 km N. W. of Tapa, in a shrubby meadow on the bank of a river.

26. VII. 1932.

leg. **H. Salasoo.**

28. *Scheuchzeria palustris* Linné. — **Rabakas.**

Rabalaugastes *Menyanthes trifoliata*-*Scheuchzeria palustris*'e ühingu karaktertaimena; ka rabastunud soodes.

Virumaa, Iisaku khk., Muraka soos.

In bogs, characteristic species of the *Menyanthes trifoliata*-*Scheuchzeria palustris* association; also in boggy swamps.

Virumaa, parish of Iisaku in the swamp of Muraka.

8. VI. 1932.

leg. **Sylvia Talts.**

29. *Phleum nodosum* Linné. — **Mugultimut (m.-oravasaba).**

[*Phl. pratense* L. var. *nodosum* (L.) Schreb., Richt.]

Kuivadel niitudel eriti Lääne-Eestis.

Saaremaa, Kihelkonna, Atla juures kuival puisniidul.

In dry meadows, especially in western Estonia.

S a a r e m a a, parish of K i h e l k o n n a, near Atla, in a dry woody meadow.

1. VI. 1931.

leg. E. Lepik.

30. *Phleum Boehmeri* Wibel. — Loo-oravasaba.

Peam. siluri ala lääneosas kuival rühapinnasel, alvaritel, *Filipendula hexapetala-Trifolium montanum*'i üh. ja *Sesleria-Filipendula hexapetala* ühingus.

S a a r e m a a, K i h e l k o n n a, Atla juures kuival puisniidul.

Mainly in the western part of the Silurian lime-district on dry rich-soil, on alvars in the *Filipendula hexapetala-Trifolium montanum* association and the *Sesleria-Filipendula hexapetala* association.

S a a r e m a a, parish of K i h e l k o n n a, near Atla in a dry woody meadow.

1. VI. 1931.

leg. E. Lepik.

31. *Melica nutans* Linné. — Longus helmikas.

Varjukates leht- ja segametsades, puisniitudel; tervel alal kaunis hari-lik, eriti *Hepatica triloba-Pulmonaria officinalis*'e ühingus.

T a r t u m a a, V õ n n u khk., Järvelselg Kastre-Peravalla Ülikooli Õppe-
metkonnas.

In shadowy deciduous and mixed woods, in woody meadows; quite common over the whole area, especially in the *Hepatica triloba-Pulmonaria officinalis* association.

T a r t u m a a, parish of V õ n n u, Kastre-Peravalla.

19. VI. 1931.

leg. E. Lepik.

32. *Festuca rubra* (L.) emend. Hackel var. *barbata* (Schrank) Hackel. — Punane aruhein.

Harilik niitudel, kuivadel nõlvadel, alvaritel kaaslasena mitmes niidu-ühingus. Puudub saliiinses vöös.

H a r j u m a a, S u u r e- ja V ä i k e- P a k r i saare vahel asuva Kapa saare kõrgemal niidul.

Common in meadows as well as on dry hillsides and alvars, as companion in various meadow associations. Is missing in the saline belt.

H a r j u m a a, in the higher meadow of the islet of Kapa between S u u r- and V ä i k e- P a k r i s a a r.

15. VII. 1931.

leg. Tatjana Amitan-Ruckteschell.

33. *Festuca polesica* Zapalowicz. — Liiv-aruhein.

(*F. sabulosa* Lindb. fil.)

Peam. mere- ja Peipsi-äärsetel luidetel, moodustades sageli suuri kogumikke (*Festuca polesica* üh.). Kohati ka sisemaal (Petserimaal).

Virumaa, Iisaku khk., Peipsi ääres Rannapungerja luidetel.

Mainly on dunes by the sea and Lake Peipsi, often forming large colonies (*Festuca polesica* association). Sporadically also in the inland (in Petserimaa).

Virumaa, parish of Iisaku, Rannapungerja, on dunes along the border of Lake Peipsi.

17. VI. 1932.

leg. A. Vaga.

34. *Scolochloa festucacea* (Willd.) Link. — Rooghein.

[*Graphophorum arundinaceum* (Lilj.) Ascherson.]

Ida-päritoluga liik, milline näht. ei ole jõudnud Eesti territooriumi läänepiirini, senini on teda jälgitud Tallinna ja Viljandini (Läti naaberflooras kuni Riia laheni). T. Ü. juures oleva Loodusuurijate Seltsi herbariumis leiduv Const. Winkler'i eks. Hiiumaalt, Tahkuna poolsaarelt vajab tõestamist.

Esineb järvede ja aeglaselt voolavate jõgede ja ojade kaldaosades madalas vees, kohati Ida-Eestis erilist *Scolochloa festucacea-Phalaris arundinacea* ühingut moodustades. Viimases seltvad selle liigiga *Nasturtium amphibium*, *Glyceria aquatica* jt.

Tartumaa, Rõngu khk., Riiska liigidal Võrtsjärves madalas vees.

An eastern element which evidently has not reached the western boundary of the Estonian territory; so far this species has been observed down to Tallinn and Viljandi (in the neighbouring flora of Lettonia till the Bay of Riga).

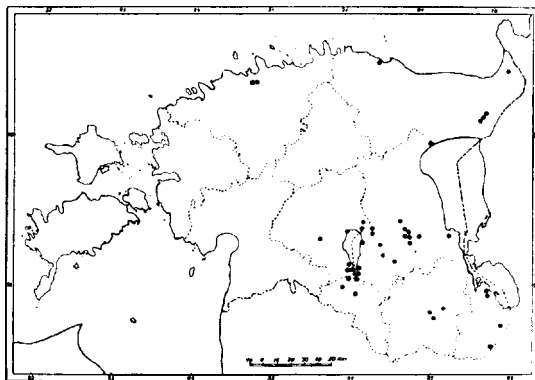
The specimen of C. Winkler from Hiiumaa on the peninsula of Tahkuna needs verification.

It is to be found on borders of lakes and along sluggish rivers and brooks, in eastern Estonia forming sporadically a special *Scolochloa festucacea-Phalaris arundinacea* association. In the latter it occurs together with *Nasturtium amphibium*, *Glyceria aquatica*, and others.

Tartumaa, parish of Rõngu, in Lake Võrtsjärv in shallow water.

15. VII. 1930.

leg. K. Eichwald.



35. Bromus Benekeni (Lange) Trimen. — **Varjuluste.**[*Zerna Benekeni* (Syme) Lindm.]

Varjuküllastes leht- ja segametsades *Hepatica triloba-Pulmonaria officinalis*'e ühingus näit. Abruka saarel. Haruldane.

Harjumaal, Jüri khk., Tammiku ligidal oosil.

In shadowy deciduous and mixed woods in the *Hepatica triloba-Pulmonaria officinalis* association, e. g. on the isle of Abruka. Rare.

Harjumaal, parish of Jüri, near Tammiku on an ås.

17. VII. 1930.

leg. **A. Üksip.**

36. Brachypodium silvaticum Roemer et Schultes. — **Mets-aruluste.**

Varjulistes leht- ja segametsades sageli *Hepatica triloba-Pulmonaria officinalis*'e ühingus, enamasti hulgi, kuid kohati, ja näib olevat mõnes maakonnas suur haruldus.

Saaremaal, Kihelkonnas, Kuusnõmme rühapinnasega segametsas, hulgi.

In shadowy deciduous and mixed woods, often in the *Hepatica-Pulmonaria* association, mostly abundant, but sporadical, and apparently a great rarity in some districts.

Saaremaal, parish of Kihelkonnas, Kuusnõmme mixed wood.

10. VIII. 1931.

leg. **K. Eichwald.**

37. Lolium remotum Schrank. — **Lina-raihein.**

Tartu ligidal Raadi mõisa põllul lina umbrohuna.

Near Tartu, Raadi, as weed in a flax-field.

27. VIII. 1924.

leg. **E. Lepik.**

38. Carex pauciflora Lightfoot. — **Väheõiene tarn.**

Turbarabadel ja rabastunud männi- ja männikase-segametsades *Sphagnum*'i liikidest koosnevas kattes koos mitmesuguste toore huumuse taimedega nagu *Andromeda polifolia*, *Eriophorum vaginatum* jt.

Tartumaal, Äksi khk., Pupastvere küla lähedal, Pursti Linnusaare ja Saariku vahelisel rabal.

In peat-bogs and boggy pine-woods as well as in mixed pine-birch-woods in a covering of bog-moss together with various plants of raw humus, such as *Andromeda polifolia*, *Eriophorum vaginatum*, etc.

Tartumaal, parish of Äksi, near village of Pupastvere in peat-bog.

16. VI. 1930.

leg. **H. Salasoo.**

39. *Carex hirta* Linné. — Karvane tarn.

Tervel alal eriti liivasel aluspinnal; lahtisel liival vegetatiivselt võsundite abil paljunedes omab vahest *Carex arenaria* välisilme; apofiüt.

Tartumaa, Laiuse khk., Tooma Sookatsejaam.

Over the whole area on sand ground. Spreading on loose sand by stolons it sometimes acquires the aspect of *C. arenaria*; apophyte.

Tartumaa, parish of Laiuse, Tooma.

20. VII. 1930.

leg. P. W. Thomson.

40. *Heleocharis uniglumis* Schultes subsp. *fennicus* (Palla). Vestergren. — Soomus-alls.

Mererannal *Juncus Gerardi* ühingus, kohati ka väikesi puhtaid kogumikke moodustades.

Harjumaa, Suure- ja Väike-Pakri saare vahel asuva Kapa saare halofiilsel niidul kohati puhta kogumikuna.

On seashore in the *Juncus Gerardi* association, sporadically forming little colonies.

Harjumaa, in salt meadow of the islet of Kapa between Suur- and Väike-Pakrisaar.

15. VII. 1931.

leg. Tatjana Amitan-Ruckteschell.

41. *Trichophorum alpinum* Persoon. — Alpi jäneslill. (*Eriophorum alpinum* L.)

Tervel alal rabastuvates soodes, kohati moodustades suuri *Trichophorum alpinum-Drosera anglica* ühingu kogumikke.

Tartumaa, Äksi khk., Pupastvere küla ligidal sooniidul, Amme ja Mudajõe ühendava kanali paremal kaldal. Saatjad (Companions): *Parnassia palustris*, *Carex flava*, *Galium palustre*, *Salix rosmarinifolia*.

Throughout the whole area in boggy swamps, sometimes forming large colonies of the *Trichophorum alpinum-Drosera anglica* association.

Tartumaa, parish of Äksi, in a swampy meadow near Pupastvere.

13. VI. 1930.

leg. H. Salasoo.

42. *Eriophorum vaginatum* Linné. — Tupeline villpea, soovill.

Tervel alal, rabades ja rabastuvates soodes, kraavides. Eriti Ida-Eesti rabadel moodustab sageli erilise *Eriophorum vaginatum*'i ühingu, mis asendab neil rabadel Lääne-Eesti rabadele omase *Trichophorum caespitosum*'i ühingu.

Tartumaa, Äksi khk., Pupastvere rabas. Saatjad (Companions): *Andromeda polifolia*, *Lyonia calyculata*, *Empetrum nigrum*, *Oxycoccus palustris*, *O. microcarpus*, *Ledum palustre*, *Betula nana*.

Over the whole area in bogs, boggy swamps and ditches. Especially in the bogs of eastern Estonia it often forms a particular *Eriophorum vaginatum* association, which in those bogs replaces the *Trichophorum caespitosum* association common in the bogs of western Estonia.

Tartumaa, parish of Äksi, in a peat-bog of Pupastvere.

14. V. 1931.

leg. H. Salasoo.

43. *Eriophorum gracile* Koch. — Sihvakas villpea.

Rabastuvates soodes, kraavides — ülekasvamisel maastuvate järvede soistel kallastel; tervel alal võrdl. harva.

Tartumaa, Äksi khk., Pupastvere küla lähedal, Saariku juures oleval rabal.

Saatjad (Companions): *Carex limosa*, *Scheuchzeria palustris*, *Comarum palustre*, *Menyanthes trifoliata*, *Oxycoccus palustris*.

In boggy swamps and ditches, on swamp borders of overgrowing lakes. Considerably rare throughout the whole area.

Tartumaa, parish of Äksi, near the village of Pupastvere, in a peat-bog close to Saariku.

15. VI. 1930.

leg. H. Salasoo.

44. *Eriophorum latifolium* Hoppe. — Laialehine villpea.

Tervel alal soodes, lodudes, puisniitudel, peamiselt allikalistel paikadel mitmesugustes ühingutes.

Tartu ligidal Ropka asunduse juures luhaniidul. Saatjaks (as companion): *Polygonum bistorta*.

Over the whole area in swamps, woody meadows, mainly on well-ground tracts in various associations.

Near Tartu, Ropka, in a meadow.

20. VI. 30.

leg. H. Salasoo.

45. *Schoenus ferrugineus* Linné — Roostepruun sepsikas.

Siluri ala lääneosa lubjarikastel soodel harilik, sageli massiliselt; *Schoenus ferrugineus-Pinguicula* üh. karaktertaim. Devoni alal esineb *Schoenus ferrugineus* harva vähematel lubjakatel allikasoodel.

Harjumaa, Jüri khk., Aruküla, Sillaotsa ligidal soos. Saatjad (Companions): *Myrica gale*, *Betula humilis*.

In the western part of the Silurian limestone area common in limy swamps, often in great quantities; characteristic species of the *Schoenus ferrugineus-Pinguicula* association. On Devonian-ground *Schoenus ferrugineus* is infrequently found in smaller limy well-ground swamps.

Harjumaa, parish of Jüri, Aruküla, near Sillaotsa in a swamp.

20. VIII. 1930.

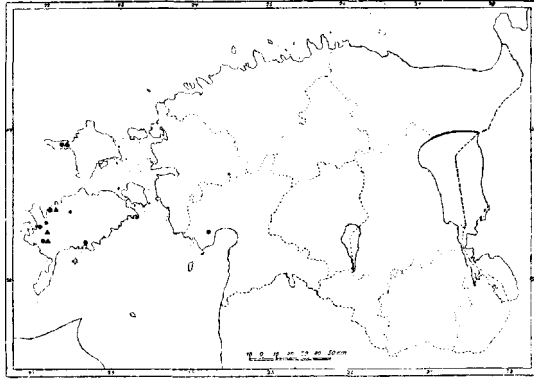
leg. A. Üksip.

46. *Schoenus nigricans* Linné. — Mustjas sepsikas.

Eestis tõenäoliselt subatlantilise relikvtaimena Saare- ja Hiiumaal, 1925. a. prof. Edm. Spohr'i poolt ka Pärnumaal, Audru khk. leitud. — Soodes, järve- ja ojakallastel, ka riimvee ulatuspiirkonnas. *Schoenus ferrugineus-Pinguicula* ühingu *Schoenus nigricans*'i teisendi (variandi) karakteristik.

Hiiumaa, Reigi khk., Heistesoo küla lähedalt Heistesoo servalt.

In Estonia presumably as a subatlantic relict plant in Saaremaa and Hiiumaa; found in 1925 by Edm. Spohr in Pärnumaa, parish of Audru. On the borders of lakes and banks of brooks, as well



▲ = *Schoenus nigricans* × *S. ferrugineus*.

as within the reach of brackish water. The characteristic species of the *Schoenus nigricans* variant of the *Schoenus ferrugineus-Pinguicula* association.

Hiiumaa, parish of Reigi, near village of Heistesoo on the margin of the Heistesoo swamp.

13. VIII. 1931.

leg. G. Vilberg.

47. *Juncus Gerardi* Loiseleur. — Tuderluga.

Läänepoolsete saarte ja mandri laus-rannikualadel, soolase ja riimvee ulatuskondades (randniitudel) massiliselt ja valitseva liigina *Juncus Gerardi* ühingus. Peamiselt ranniku iseloomust (glint, luidestikud) sõltuvate ebasoodsate ökoloogiliste tegurite tagajärjel mandri idapoolel harvem või puudub.

Harjumaa, Suure- ja Väike-Pakri saare vahel asuva Kapa saare halofiilsel randniidul.

Found in great quantities on flat coasts in the western part of the territory and on the western islands within the reach of salt and brackish water as dominant species in the *Juncus Gerardi* association. More rare or missing in the eastern part of the territory, mainly on account of unfavourable ecological factors, arising from the character of the seashore.

Harjumaa, in salt meadow of the islet of Kapa between Suure- and Väike-Pakri saar.

15. VII. 1931.

leg. Tatjana Amitan-Ruckteschell.

48. *Toffeldia calyculata* (L.) Wahlenberg. — Lemmelil.

Lubja-aluspinnasega soodes ja puisniitudel eriti *Schoenus ferrugineus-Pinguicula* üh.; sagedam mandri lääneosas ja saartel; devoni alal väga harva.

Saaremaa, Kihelkonna, Kuusnõmme Bioloogiajaamast kirdes allikasoo ääres osas üksikute mändide all.

In swamps and woody meadows with calcareous subsoil, especially in the *Schoenus ferrugineus-Pinguicula* association; more frequent in the western part of the territory and on the islands; very rare on Devonian ground.

Saaremaa, parish of Kihelkonna, N. E. of the Kuusnõmme Biological Station on the edge of a swamp with solitary pines.

4. VII. 1932.

leg. Elsa Pastak.

49. *Majanthemum bifolium* (L.) F. W. Schmidt. — Leseleht.

Esineb mitmesugustes metsaühingutes toorel huumusel, eriti rohkelt *Vaccinium myrtillus-Majanthemum bifolium*'i ühingus.

Saaremaa, Kihelkonna, Kuusnõmme Bioloogiajaama pargimetsas, kuuse-, männi- ja sarapuude all.

To be found in various wood-associations on raw humus, most abundantly of all in the *Vaccinium myrtillus-Majanthemum bifolium* association.

Saaremaa, parish of Kihelkonna, in the park-wood of Kuusnõmme under spruces, pines and hazels.

2. VII. 1932.

leg. Elsa Pastak.

50. *Malaxis paludosa* (L.) Swartz. — Sookäpp.

Rabastuvates lodudes, õõtsuvates rabades ja soistes männi-sookase metsades; kohati massiliselt *Rhynchospora alba-Drosera anglica* ühingus.

Pärnumaa, Pärnu khk., rabastuvast lodus Soometsa külast läänes.

In boggy marshes, swinging bogs and swampy mixed pine-birch-woods; sometimes in great quantities in the *Rhynchospora alba-Drosera anglica* association.

Pärnumaa, parish of Pärnu, boggy marsh west of village of Soometsa.

28. VII. 1930.

leg. T. Lippmaa.