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Urban ecosemiotics of trees: Why the ecological alien species paradigm has not gained ground in cities?

Riin Magnus, Tiit Remm

Department of Semiotics
University of Tartu
Jakobi 2, 51005 Tartu, Estonia
e-mail: riin.magnus@ut.ee; tiit.remm@ut.ee

Abstract. The transportation and translocation of species beyond their natural habitats is considered to be one of the major causes of biodiversity loss these days. Concerns are growing also about urbanization and the resulting destruction of natural habitats. At the same time, the integration of urban environments into nature protection efforts has brought along the intent to apply the ecological alien species paradigm in cities. Yet, as the practices of urban landscaping demonstrate, this objective has not been achieved. In this article, we propose that the reasons behind it are largely related to the specifics of the city as a semiotic system. Multiplicity of codes and subjects of various origins is contested by the ecological alien species paradigm, yet characteristic of the urban semiotic environment. The city often serves the function of a cultural model, embodying the principles of setting the borders between Self and the Other. Also in this case, the ecological alien species paradigm has to face a different complex of meanings attributed to the Other. We demonstrate how two different models of the city are expressed in the interpretations of alien trees by using pyramid oaks and poplars in Estonia as an example.

Keywords: urban semiotics; ecosemiotics; alien species; poplars; pyramid oaks

Given that cities are not only human habitats, but involve the life activities of a variety of non-human living beings, also the identification of Self and the Other depends on an interplay of cultural and ecological processes. We would like to suggest the as yet unestablished research field of urban ecosemiotics for studying the multilayered complex of biological, cultural and social semiotic processes characteristic of cities, including the primary distinction of Self and the Other.

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The basic premises of urban ecosemiotics are that not only humans, but also other species are capable of meaning generation, and that cities provide a specific context for interspecific sign processes which differs from natural environments.

The distinction and antithesis between Self and the Other has been considered as a semiotic universal, which underlies the formation of the semiotic subject and its characteristic ways of meaning making (Lotman 1975: 97; Lepik 2008: 62). The antithesis is present at different semiotic levels, from the biological to the social and the cultural, and is manifested in diverse signs of identity and otherness, of belonging to a social group or recognizing fellow specimen. The concept of alien or non-native species is an example of such a distinction that at the same time links natural and cultural (semiotic) processes (see also Robins 2004; Rotherham, Lambert 2011). In the ecological paradigm, the designation of certain species as alien in contrast with native species reflects a concern about the effect these species might have on ecosystems. As Marcus Hall has pointed out, if species are categorized on the basis of the polarity of 'native' vs 'alien', they are conceived of with a different set of connotations than if they were covered by the alternative oppositions of 'tame' and 'wild' or 'neophytes' and 'archephytes', 'exotic' and 'native' (Hall 2017). According to the ecological definition, an alien species is "a species introduced by humans – either intentionally or accidentally – outside of its natural past or present distribution."[1] However, the recognized temporal threshold for non-native species varies from country to country, overlapping with the beginning of the European colonization in the US and Australia, while being dated to the 18th and 19th centuries in Estonia,[2] the area which will be in the focus of this article. Since the 1960s, when invasion biology became a separate field of ecological studies, alien species have been considered as a major threat to local biota and hence a major cause of biodiversity loss (e. g. Wilcove 1998; Early *et al*. 2016). Despite the seeming consensus among ecologists about the invasion potential of alien species, urban environments pose a challenge to the ecological paradigm of alien species.

The common practices of urban landscaping, preferences of citizens, as well as the studies of urban biodiversity themselves, indicate that the critical attitude towards the introduction of alien species into local ecosystems has not gained ground in the urban context. The number of alien species in urban greenery exceeds, or competes with, the number of local ones. For example, in the Estonian capital Tallinn, out of the 480 taxa of trees that have been registered 449 are non-

1 IUCN, *Invasive Species*. Available at: https://www.iucn.org/theme/species/our-work/invasive-species (retrieved on 14 June, 2018).

2 Keskkonnaministeerium, *Võõrliigid.* Available at: https://www.envir.ee/et/voorliigid (retrieved on Jun 14, 2018).

native, while only 31 (6.5%) taxa of trees are native (the trees of the Botanical Gardens are excluded from the data) (Sander *et al*. 2003: 440)). The number of alien species in towns has also been growing in time. Kowarik *et al*. (2013) found that the percentage of spontaneously occurring alien woody plant species in Berlin flora rose from 16% at the end of 18th century to 67% at the end of the 20th century. Citizens also sometimes tend to prefer exotic outlooks of green areas to those composed of native-looking species (Hoyle *et al*. 2017). Biodiversity counts and assessments, when conducted in urban environments, include non-native species in their counts and some specimen of non-native species are under nature protection in cities as valuable part of natural heritage (Dallimer *et al*. 2012; Hope *et al*. 2003).

Adopting an urban semiotic perspective, we propose in this article that the reasons for the difficulties of introducing the ecological alien species paradigm into urban environments are largely related to the specifics of the city as a semiotic entity. Moreover, also the causes of the alien species diversity in cities are largely of a semiotic kind. By combining the Tartu-Moscow School's semiotic analysis of cities with ecosemiotic observations of the participation of trees in semiotic processes, we aim to demonstrate how the city-specific meaning relations affect the viability of the ecological alien species paradigm. We propose that the acceptance or rejection of alien species in cities depends on the particular ways boundaries are established between Self and the Other and the identity of the city is built via the multiplicity of codes and encounters. It also depends on the cultural model and orientation that the city embodies, as this determines the characteristics of the species which influence their acceptance or disapproval in a particular place.

Besides the meanings related to the specifics of urban semiotic processes, also the historical layers of meanings of alien urban trees are of significance. Since urban greenery became more widely spread in 16th-century Europe, alien trees have become associated with a variety of cultural meanings, which the paradigm of alien species necessarily has to face if it were to gain ground in an urban context. Beyond the particular attribute of 'alien', it is also important to note the special status of trees themselves as cultural mnemonic devices. Such a function is related to their aliveness, similarly to humans, and to their immobility, which makes them similar to landscapes (Bloch 1998), as well as their status as living entities spanning many human generations (Davies 1988).

Urban semiotics and non-human species

The approaches of urban semiotics to the questions of Self and the Other relate to identity construction on different levels – most general models of cultural (self-) descriptions (e.g. Lotman, Uspenskij 1984; Lotman 1990: 191–202), semiotic practices of subcultural identities and community-building (e.g. Randviir 2011), and encounters in social interactions in the city (e.g. Bridge 2005). These directions cohere with the sociocultural definition of the city. The city is a sociocultural phenomenon that is characteristically based first on social diversity that, besides a variety of roles and role expectations, involves, to a remarkable degree, impersonal and voluntary relations and interactions. Second, it is a part and an expression of the cultural worldview (including values, norms, and knowledge) of the society. Third, positioning these two in relation to the urban space, the city as a living environment of human community and other species is a condition and manifestation of these encounters and models. Besides being a stage, substance and expression of social and cultural relations and processes, the urban environment also entails agency of humans as well as other species living there. However, the role of other species besides humans in the formation of cities as semiotic entities has not received much attention so far.

The ecological network of interspecific relations in cities is partly grounded on semiotic relations. The organisms may participate in all major semiotic processes, designated by Thure von Uexküll (1997) as: (i) information or signification semiosis (all semiotic activity on the receiver's/interpreter's side); (ii) symptomatic semiosis (cues of the living being not addressed to the receiver); (iii) communicative semiosis (signs sent to the receiver by the sender and interpreted by the receiver). The organic and material processes of trees affect the ecosemiotic functioning of the city as symptoms, while the interpretation of trees in active management of greenery functions as signification that attributes semiotic agency to the trees (reflected in the expressions about tree roots destroying pavement, branches intruding into the walking space of pedestrians, a hedge "wanting" cutting, etc.). The latter leads to human communication with the *imagined Other*, which at the same time functions as autocommunication.

As living beings, urban trees grow, become acclimatized, multiply, may get sick and grow old, and finally die. Some of these processes (as symptoms) may be supported and others suppressed by human activities, and yet, if the trees are to exist in an urban environment, the biological processes cannot be fully ignored or reshaped. The selection of species and specimen, the maintenance and management, but also the cultural representations that mediate human activity have to respond or at least consider the ecological meaning relations that trees

are part of. Such a consideration of the co-presence of cultural and biosemiotic processes has been a tenet of ecosemiotics (Keskpaik 2003; Maran 2007). To our knowledge, no ecosemiotic work has been devoted solely to trees, but the ecosemiotic contention resonates well with some recent "more-than-human" approaches in cultural geography and social anthropology, which discuss the role of trees in shaping human forms of existence as well as the entanglement of human ways of life with those of trees. Cultural geographers Owain Jones and Paul Cloke advocate the mutual implications of trees and culture as 'arbori-culture'. By unfolding the specific agency of trees and their importance in place-making, they emphasize:

> Trees are culturally constructed representing a form of social nature, but they are also living, active, creative, physical presences. This mix of the cultural, the material and the living presents interconnected agency and performance wherever trees are to be found. (Jones, Cloke 2002: 74)

Hence, interpretations of trees depend on cultural concepts and descriptive systems, actual interactions and practices, as well as the ecological relations of trees and other organisms.

The interpretation of urban trees in the context of the idea of 'native or non-native species' is a case of meaning-generation interlinking three domains: cultural identity, the idea of ecological range for trees, and co-presence of human individuals and trees in actual urban situations. In addition, a particular spatial meaning-making should be noted in interpreting non-native species in relation to sociocultural phenomena like cities. Namely, simple spatial or topological terms (or topological metalanguage as discussed in Lotman 1975) are used to structure cultural, ecological and psychophysical interpretations of trees. Hence a specific meaning potential appears in correlating the categories of 'internal' / 'external' of cultural space with 'native' / 'non-native' of ecological space and further with the psycho-physical presence of people and trees in behavioural urban spaces. Such a widespread use of spatial modelling in society enables an apparent unified measure and also generation of meaningful coherence in interpretations (see also Remm 2015, 2018). Potential links are further actualized by projecting all three domains onto geographical space. Merging the three into one conceptual domain enforces the apparent universality, territoriality, objectivity and actuality of the distinction of native and non-native species.

Urban encounters and cultural models

Non-native trees in the city have a special position that has to do with the city as a sociocultural phenomenon. There are two distinct traits of the city that can provide oppositional perspectives for interpreting non-native trees in the city: (i) the city is a meeting point of differences, and (ii) the city is also a unitary model for culture.

First, from the perspective of social and cultural practices and dynamics, the city is a dialogic meeting point, a place of sociocultural heterogeneity. Lewis Mumford (1970: 480) has described the city as "a related collection of primary groups and purposive associations", an intensified "drama" of various social groups. In cultural semiotic terms, Lotman describes the city as *a culture generator* and *a melting-pot* of languages, texts and codes:

> The city is a complex semiotic mechanism, a culture-generator, but it carries out this function only because it is a melting-pot of texts and codes, belonging to all kinds of languages and levels. The essential semiotic polyglottism of every city is what makes it so productive of semiotic encounters. The city, being the place where different national, social and stylistic codes and texts confront each other, is the place of hybridization, recodings, semiotic translations, all of which makes it into a powerful generator of new information. (Lotman 1990: 194)

Roland Barthes (1967) sees this creative aspect of the city in the possibility of meeting an unfamiliar *Other*. It is thus essential for the city to bring together not only different sign systems but also different semiotic subjects and signs of differences.

Against the background of the polyglossia of the city and the normality of multiple identities and languages, alien species gain a different meaning than they would in a natural environment. The city as a melting pot treats non-native species as a normality, as something which contributes to this plurality of encounters and hence welcomes the non-native non-human inhabitants. The plural origin of urban species has been highlighted as a potential gateway to address the identity of multiple ethnic groups living in cities (Kendle, Rose 2000). This is a way of confirming the normality of the co-presence of beings of different origin and in contrast to the ecological paradigm, to reinterpret the origin factor not as something to be condemned but as something that contributes to the overall urban diversity. Also, cities tend to maintain a plurality of the codes and purposes via which certain elements are chosen and included in the urban environment. In the case of trees, the selection principles can rely on economic, aesthetic, or ecological grounds, as well as socio-cultural identities or traditions and fashions in urban planning and landscape architecture. This persistent plurality of codes

and principles might be a reason why it has been relatively hard for the ecological paradigm of alien species to gain ground in an urban context.

Second, from the perspective of cultural models the city is a part of a cultural world image that contributes to the organization of this image (Randviir 2000). It is a cultural model that organizes cultural self-descriptions and designs of the environment. Non-native trees (or any other non-native species) thereby gain a special status as elements in those self-descriptions of culture, allowing manifestation of, and establishing connections with, the cultural Other. The mental model of the city (e.g. the idea of the Heavenly Jerusalem in Christian culture) is present in various expressions of culture. The actual city in turn appears as a distorted material-spatial manifestation and practical realization of the cultural model; particular designs and their interpretations depend on dominant organizations and semiotic procedures in the society (Lagopoulos 1983; Randviir 2010).

Being a model of the universe, for an urban-oriented society at least, the city has a fundamental place in the self-modelling of the society. The urban environment is not merely a meeting point of various texts and codes, but it also frames and resemiotizes them from the perspective of the city, its community and culture. Each element of the city gains a meaning in relation to the dominant interpretation of the city. The array of semantic coding of urban space and elements therein is variable (see e.g. Lagopoulos; Bokland-Lagopoulou 1992; Eco 1986[1968]). Distinctions and markers of the Self and the Other are among these, and appear as central when it comes to the semiotization of the environment in relation to cultural identity; other species can also be employed in these processes of demarcation as sign vehicles for cultural meanings.

As two distinct cultural models, Juri Lotman (1990: 191–192) points out different relationships between a city and its hinterland, based on the city's conceptual location in respect to the region. The city can be isomorphic with the state, function as an ideal model of eternity, and be conceptually located in the centre (*concentric model*); or it can be opposed to the rest of the land, be located on its boundary or outside of it, related to the foreseen reality and often to some other (imaginary) culture (*eccentric model*) (see Fig. 1). Historically, understanding a city as something which embodies an ideal state yet to come might bring along the re-location of the capital, as the relocation of the capital of Russia from Moscow to St Petersburg, to the geographical margins of the country at the beginning of the 18th century.

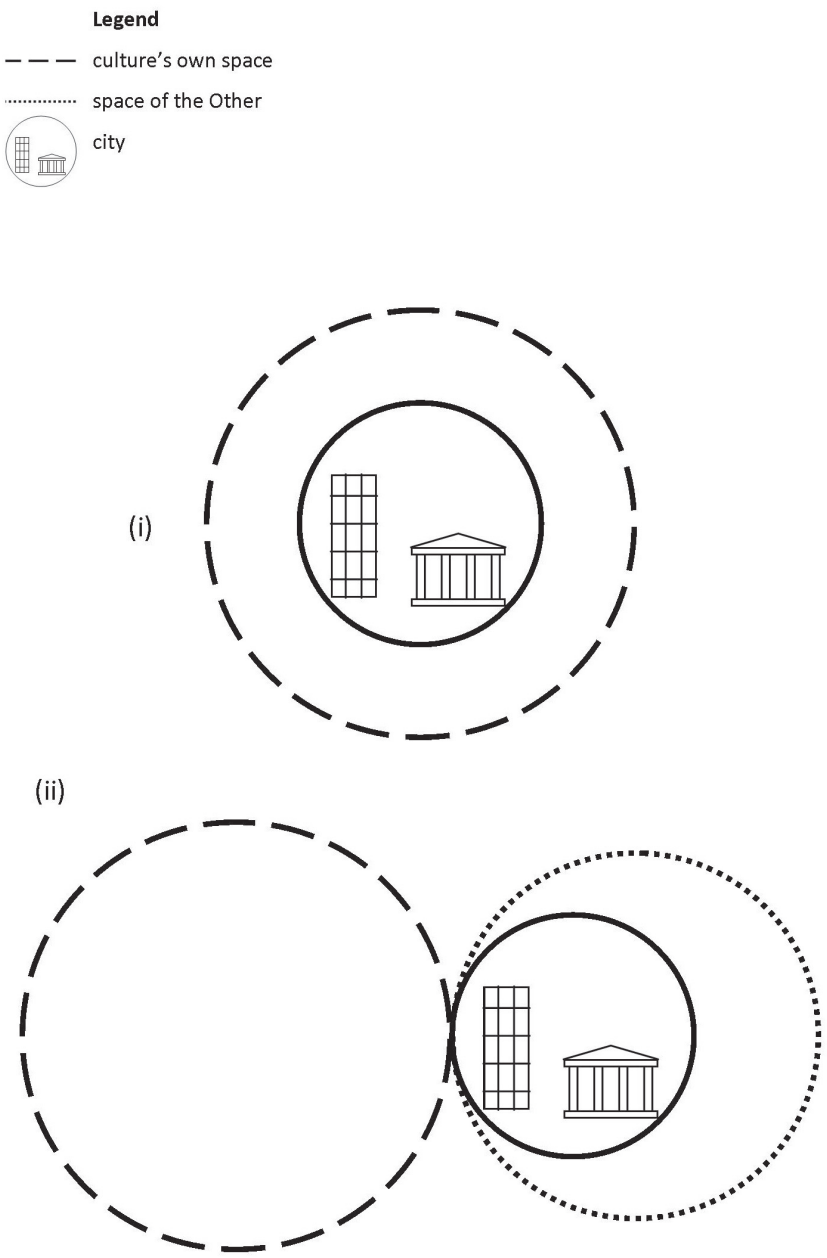

Figure 1. The city in two cultural models (following Lotman 1990):
(i) concentric model where the city is isomorphic with the culture and its space;
(ii) eccentric model where the city is located on the boundary or outside of the cultural space.

In relation to the city as a cultural model, trees in the city can function as markers of identity and positioning the Self in cultural space. For this, a distinction of *native* and *non-native* trees or some other form of *'own' – 'alien'* distinctions of trees (e.g. 'useful' – 'dangerous') needs to be involved and applied in order to conceptualize cultural identity by the means of the city and its elements. In this context we can outline some typical roles of alien but also local trees.

If the former, isomorphic and concentric idea of the city is prevalent, favouring the growth of local species in urban environment helps to confirm and maintain the image of self-sufficiency, of cultivating the cultural ideal of the here and now. Local nature in the urban environment might confirm the status of the city as a conservative centre of the country. In contrast, alien trees would appear as signs of the cultural Other in the city, which is necessary but peripheral and possibly stigmatized. This 'native' – 'non-native' dichotomy can, however, be pushed aside by the tree's own ecology, whose status can shift along the 'own' – 'alien' scale if it appears to carry some initially unknown pleasant or unpleasant traits. Peter Coates reports how the ailanthus tree or the so-called "tree of heaven" (*Ailanthus altissima*), which was introduced to American cities in the 1780s and which had divided people concerning its acceptability received appreciative voices once it survived the attacks of a canker worm in the 1850s New York to which all other trees fell victim (Coates 2006: 121).

In the light of the antithetic or eccentric idea of the city, the role of alien trees appears to be more dynamic. By introducing species which originate from another corner of the world and establishing a contrast with the local species, the city does not have to be relocated geographically in order to instantiate a new centre, which would embody the desired ideal. Instead, the semiotic relocation of the city and with this the displacement of the ideal can take place within the city itself by settling it with items and species stemming from other places and resulting in a surrounding which Edgar Anderson has referred to as "transported landscapes" (Anderson 1969). The city thereby transforms its composition and becomes another place without geographical displacement. In such an internal relocation the alien species provide an indexical link with their place of origin or some other associated place, which might be the desired ideal. The ideal itself can be either tied to the yearning for some past state of existence, to ideals embodied by some other place and culture, or to an imagined future not yet present anywhere. In the case of human migration, trees can represent the homeland with nostalgia – an ecologically alien tree, which provides a link with home culture can help to maintain one's identity. Estonian ethnologist Aivar Jürgenson has reported how Estonian immigrants in Buenos Aires cultivated cornflowers (*Centaurea cyanus*) – typical Estonian field flowers and national flowers since 1968 – in their

gardens. Attempts were also made to plant birches (*Betula pendula,* often planted in the yards and associated with the notion of the home in Estonia) there, but these attempts failed due to the unsuitable humid subtropical climate and soil conditions (Jürgenson 2012: 19). After the French revolution the ideal of fraternity in France was associated with trees of non-native origin, mostly stemming from the US, which had preceded France with its revolution (Lawrence 2006: 136). This symbolic value of species of various origins is again in opposition with the ecological paradigm's hesitations about non-native trees.

To illustrate the role of trees in articulating the city as a model, we will next discuss two examples from Estonia – the use of pyramid oaks (*Quercus robur f. fastigiata*) and non-native poplars (*Populus sp.*) in the public greenery. Pyramid oaks serve to illustrate the eccentric model of the city (displacement of the cultural ideal and identity), while poplars in turn illustrate a shift from the eccentric to the concentric cultural model.

Pyramid oaks and the eccentric cultural ideal

The symbolization of the cultural Self and Other through trees is based on their ecological as well as formal characteristics. The pyramid oak belongs to the same species as Estonia's native oak tree (*Quercus robur*), being one of its cultivars. Although largely sharing the genetic material with the local oaks, it is generally selected as suitable for urban space due to its specific phenotypic characteristics and low maintenance costs. However, there might be other reasons involved in the selection of this cultivar, depending on the time, region and the trends in urban greenery. For example, in the 1990s' Britain, planting of pyramid oaks was associated with the plans to enhance urban biodiversity by planting native trees. However, as Mark Johnston (2017) has pointed out, ironically all the specimens of the tree were genetically identical clones. Furthermore, the use of clones results in standardized outlook of trees in the urban landscape.

In the following, we will focus on the example of the Estonian city of Tartu that has a high concentration of pyramid oaks of different ages which also figure in the identity formation of the city. Tartu is the second largest city in Estonia with the population of ca 100.000; in written sources, it was first mentioned in 1030. In terms of cultural models of the city, Tartu has been related to the concentric model (cf. Velsker, Soovik 2017; for a conceptualization from 1637 see e.g. Risingh 2009); it also served as an isomorphic type of the centre for Estonian national identity formation during the 19th and the early 20th centuries (see e.g. Kruus 1920). For centuries, Tartu has been known as a university town. The University of Tartu was

established in 1632 by the Swedish king Gustavus Adolphus. After having been closed down in the early 18th century, the university was re-opened in 1802. The extensive building activity that took place in Tartu for the re-opened university followed the Neo-classical line of reconstructing the city after devastating wars and a great fire in 1775. The style was also resonated in the Stalinist Neo-classical style reconstructions of destroyed buildings after World War II and remains a part of the visual identity of the urban centre today. In parallel to these building activities, there were two distinct periods of extensive planting of trees in the public space of central Tartu: the design of a large public park on Toomemägi Hill with its ruins of fortifications and the cathedral by the recently reopened university (with some difficulties involved, as the first birches and poplars planted were eaten by the townspeople's cattle) together with the founding of the Botanical Gardens at the beginning of the 19th century; and clearing of the ruined districts in the city centre after World War II together with the planting of parks and alleys of linden trees that remain today in the core of debates of urban greenery *versus* buildings in the centre.

The statements of the city architects and ecologists as well as the meanings that appear in culture texts and in the spatial meaning relations, allow us to suggest that in Tartu pyramid oaks embody a certain cultural ideal for the city's ensemble of architecture and greenery as a whole.[3] The significance of pyramid oaks for the identity of Tartu was suggested to us by the former city ecologist Mart Külvik: "Arnold Matteus[4] has said that he, for example, favoured the planting of those pyramid oaks; and this has become a kind of an identity for Tartu: I, as much I could, also recommended planting them."[5]

The trees have been considered as a dendrological speciality of Tartu (Alakivi 1967; Masing 1982: 167), and there are even belletristic claims of pyramid oaks being the distinctive trees of Tartu by the Estonian writer Heino Kiik (1987: 121–122): "If we wished to distinguish Tartu from other Estonian towns by one detail, we could say: Tartu is the town of pyramid oaks. It is one already now, but if we entertained this wish, still more of them could be planted, in great numbers".

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[3] Interestingly, pyramid oaks have been recorded as trees that were extensively planted in the Baltic provinces at the end of the 19th century (Klinge 1883), but not even mentioned in the newspaper articles about the tree species of Tartu's gardens and parks in the 1920s (Lundström 1922a, 1922b).

[4] Arnold Matteus (1897–1986) was the City Architect of Tartu from 1926–35 and 1941–1960.

[5] Interview with Mart Külvik, 27.04.2017. Translations from Estonian are made by us, R. M., T. R.

Figure 2. A pyramid oak behind the University of Tartu's Neoclassical main building (1809), next to the statue of the University's founder Gustavus Adolphus. The tree was planted in 2007 by Queen Silvia of Sweden to commemorate the 375th anniversary of the University. (Photo by the authors.)

The pyramidal and vertical shape of the oaks can be perceived as complementing Tartu's Neoclassical architecture, and the image of Tartu as the Athens on the Emajõgi (the river that runs through Tartu). The nickname of 'the Athens on the Emajõgi', that is commonly used even today, and the description of the town as a travel destination of muses was used already in 1632 – in the same year when the university of Tartu was established – by the German history professor Friedrich Menius (Menius 1997[1632]). While pyramid oaks appear in the city in ensemble with Neoclassical 19th-century architecture (see, e.g., the recently planted tree next to the 19th-century main building of the university in Fig. 2), they often also accompany Soviet modernist architecture while still symbolically referring to the Athens on the Emajõgi (see Fig. 3).

Figure 3. Pyramid oaks in front of a modernist Hrushtshev-era block of flats in Kuperjanovi Street.

Providing an iconic resemblance to the pillars of classical architecture as well as Mediterranean cypresses and Lombardy poplars, but also profiting from the species' noble reputation, pyramid oaks allow to enculture the Self via the identification with the cultures of the antiquity. In comparison with the local oak trees (growing e.g. in the Tartu city district called Tammelinn [Oaktown]), the pyramid oaks seem cultivated and non-local – thus, advocating the planting of pyramid oaks expresses an ideal, which has been projected elsewhere in space and time. Yet as the species of the tree is local, and the architecture to which it relates is spatially and temporally present here and now, the localization of the ideal becomes abstract – it is here, yet it is not here, either. Hence, the tree being encompassed by the cultural ideals enhances its role for the sociocultural reflections in the society.

The case of pyramid oaks in Tartu thus exemplifies the exotic and externally located ideal incorporated in the city's material and formal configuration via associations with architecture. Such meanings have thereby gained a naturalized status, becoming part and parcel of the town's identity. In the light of the ecological paradigm's favouring of local species and forms, these meanings would be questioned and challenged. Yet even if the idealized Other is culturally (antiquity), ecologically (cypresses and Lombardy poplars) and geographically (the Mediterranean) remote, pyramid oaks are not ecologically alien but cultivars of a local species, which have acquired their significational effect due to their distinct

shape. From the ecological perspective, one might rather question the origin of individual plants and the tendency to use clones. In semiotic terms, the pyramid oaks in Tartu represent a case of combining the idea of the oak as a sacred symbol in Estonian traditional culture[6] with a visual image of the cultural ideal referring to the antiquity so that the tree becomes symbolic of the city and its cultural ideals, with connotations of both the local and the exotic antiquity and intellectuality (see Fig. 4).

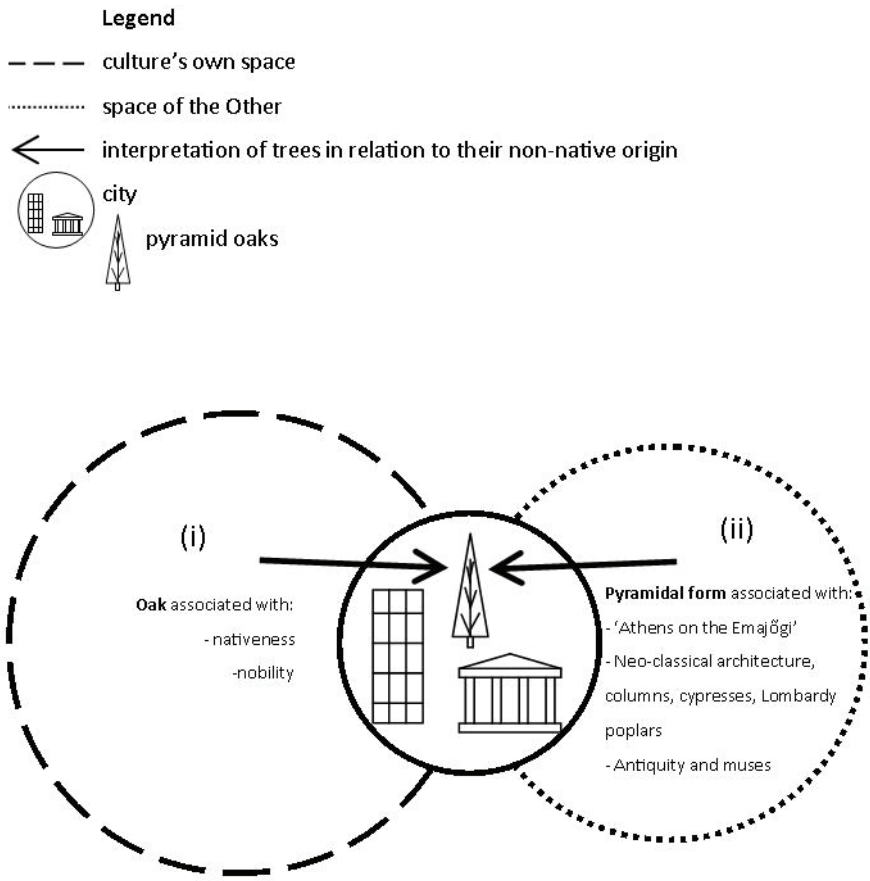

Figure 4. Pyramid oaks combining two models in the identity of Tartu and positioning the city eccentrically on a cultural boundary between the local culture and displaced ideals: (i) the oak as a noble native tree; (ii) its pyramidal form referring to cultural ideals temporally and spatially displaced to classical antiquity.

[6] Ott Heinapuu has demonstrated how the sacred grove of oaks and the symbolic image of the oak as the sacred tree of ancient Estonians was itself largely an invention of the late-19th century Romanticist authors (Heinapuu 2010).

Poplar as the marker of an identity shift

Changes in the self-description of a city take place along with the change of the meaning of its individual constituent elements. We would like to illustrate such a shift in the self-description by looking at how attitudes towards non-native poplar species in Estonia have changed from idealization to associations with occupation powers and unwanted foreigners. Poplars are said to have been common trees in public spaces in ancient Rome and the name of the genus, *Populus*, to be derived from the Latin phrase '*arbor populi*' as 'the tree of people' (Dickmann *et al*. 2001: 3).

The introduction and cultivation of non-native poplars (i.e. except *Populus tremula*) in Estonia began in the 18th century (Tamm 1971); some of the oldest specimen have been found growing next to Orthodox churches in Tallinn and Paldiski (Sander 1998; Sander 2005). By the late 19th century, some species of poplars (e.g., *P. nigra, P. balsamifera, P. x berolinensis*) were rather widespread in the Baltic provinces of Estonia, Livonia and Courland (Klinge 1883). During Estonia's first period of independence, in the 1920s and 1930s, they were promoted as productive trees which should be planted by the farm yards due to their fast growth (Viirok 1930). The innovative manor owner Count Friedrich Berg (1845–1938) introduced the example of French peasants, who were extensively using poplars for different purposes, to be followed by Estonians. He recommended poplars as fast-growing trees that provide quick shelter and greenery to those building their homesteads in new settlements (Berg 1924: 195). Promotion of fast-growing poplars at the beginning of the 20th century can be related to their rising importance in the growing paper industry in need of raw material (Naiman 1932). Interestingly, by the 1930s the presence of poplars in Estonia was so common that they were even considered as native trees (Viirok 1937: 154) and suggested also as trees suitable for greenery in the Estonian patriotic home decorating guidelines (*Kodukaunistamise* 1936). After World War II they were used extensively to protect railways against snow (Margus, Tamm 1967: 9), in experimental forestry, and for greenery in the new developments of industrial towns (Sander, Levald 2005). In Estonian forestry, poplars were used most extensively in 1951–1952 and 1964–1967, but most of these plantations had perished by 1979 when the experiment was already considered as unreasonable due to Estonia's long daylight hours in summer, and short period of vegetation (Etverk 1980: 390).

Despite the experiments in forestry, poplars have remained mainly trees of urban greenery in Estonia. During the Soviet times, the species *Populus x berolinensis* became very popular and was planted extensively as an alley tree. As the architecture historian Oliver Orro has noted, the poplars with their rapid growth were supposed to create an illusion of fast progress in urban greenery

during Stalinist times (Orro 2015). Poplars featured in the Stalin-era propaganda songs extolling massive forest plantation in steppes (e.g. Part 4 "The pioneers plant the forests" of Dmitrij Shostakovich's and Evgenij Dolmatovskij's oratorio *The Song of the Forests*, Op. 81, 1949). In the Estonian children's magazine *Täheke*, poplars are in turn introduced to children as trees of the resorts on the Black Sea coast (e.g. *Artek* 1967) and landscapes of the Soviet South (e.g. Malkov 1971; Niinepuu 1974; Tali 1967) as well as urban developments (e.g. Kesamaa 1960). After the end of Soviet occupation in the 1990s, the trees were associated with Soviet power and its Union-wide production plans which would ignore the local conditions and needs. The fact that poplars had been as important during pre-war times of Estonia's independence and considered as almost local was forgotten and they came to symbolize foreign power and colonization instead. Compared to the oral tradition, such explicit labelling is rare in written materials. An example of such vernacular signification can be found in connection with the heritage of former Soviet military bases in Estonia: "What will happen with the base? Well, it will run wild by itself, the pine will come. And the poplar, this Russian [here used as synonymous with 'Soviet' – R.M., T.R.] national tree. 'First an alley of poplars was planted and only then a house was built' laughs the forester" (Mets 1997: 18). In 2010, a local Village Society (*Võrnu külaselts*) proudly announced the removal of poplars that had been planted in the 1950s with the following comment on their web page, "It is to be hoped that the far-reaching roots will also disappear like tentacles which are reluctant to disappear, just like the way of thinking at the time of their planting."[7]

If fast growth was the highlighted characteristic of poplars when planting them was promoted, the spreading tufts of long, soft, white hair of the female specimen became the focus of "unwanted foreigner" narratives of poplars. However, such species attributes might not necessarily gain dominant significance in public perception. So the rise of the 'green cities' idea advocates the value of any plant in town, while people who have become accustomed to the presence of the alien species in their surroundings take those as a natural part of their environment and become protective, once the presence of the trees is under threat. Thus, a poplar alley along the bank of the Emajõgi River in Tartu (Fig. 5) has triggered historical-ideological disputes on whether it originates from the Soviet or earlier times, as well as arguments for its preservation in the context of urban development (Eesti Roheline Liikumine 2011).

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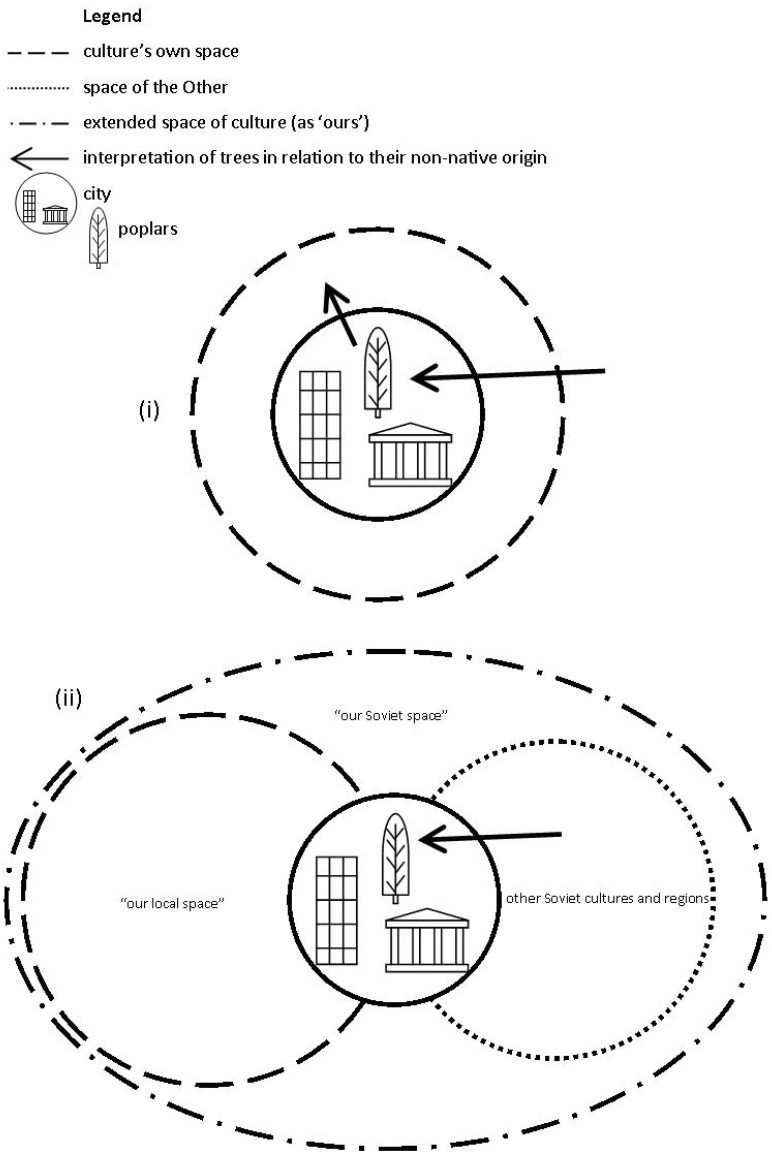
7 Võrnu külaselts, *Paplite kadumine*. Available at http://www.waerkun.org/paplite-kadumine (retrieved on 15 June 2018).

Figure 5. Poplar alley by the riverside in Tartu.

As a productive tree species grown by Western European peasants that was to be adopted also by Estonians, in the early 20th century the poplar embodied a progressivist cultural ideal located elsewhere. After people had become accustomed to their presence in greenery, they acquired a near-native status. During the Soviet era poplars were connected with the idea of socio-economic progress but the earlier eccentric cultural ideal relating poplars to *foreign* practices shifted now towards a geographically extended identity – Estonia as a part of the Soviet Union with poplars as common features. In the post-Soviet times, the foreign origin of the trees was turned into an object of dislike, while there was also a shift towards a more local identity and a concentric model of city-culture relations. Changes of the political system also affected the meaning attributed to the trees. Such meanings could support the implementation of the ecological alien species paradigm and the perception of the trees as alien, but in the example of Tartu one can rather see the recognition of the value of tall poplars as an important part of urban greenery and the establishment of personal attachment to the trees despite their origin (see Fig. 6). Although potentially resulting in a positive outcome for the ecological alien species paradigm, attaching an ecological paradigm to a political one may turn the ecological meaning into an easy target for political manipulation.


Legend
culture's own space
space of the Other
extended space of culture (as 'ours')
interpretation of trees in relation to their non-native origin
city
poplars
(i)
(ii)
"our Soviet space"
"our local space"
other Soviet cultures and regions

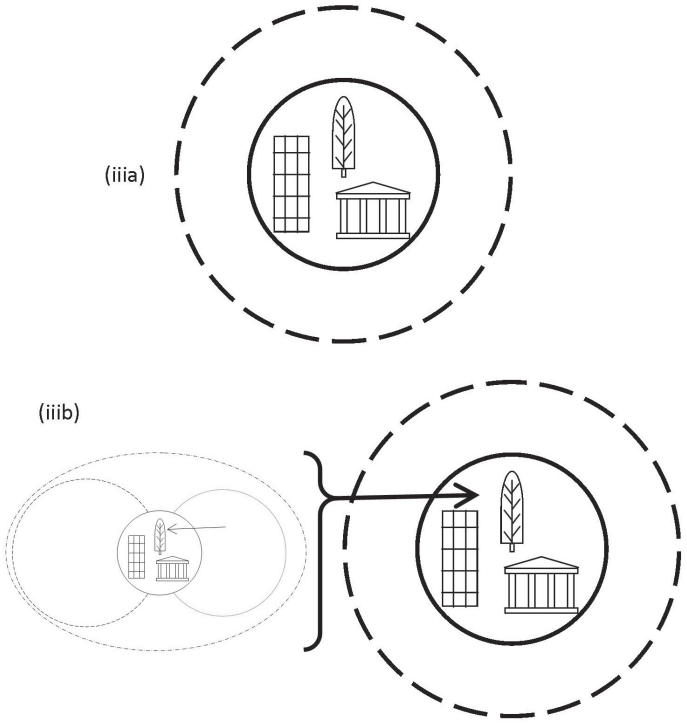


Figure 6. Shifting identity and signification of poplars in Estonia:
(i) poplars interpreted as non-native means of local modernization; their later interpretation as local elements of the environment (the 1920s–1930s);
(ii) poplars seen as non-native in Soviet Estonia; they appear native in an extended context by widening the boundaries of "our" space in the cultural-semiotic geography from Estonia to the Soviet Union, e.g. poplars at the coast of the Black Sea appear as elements of the Soviet Estonian identity (the 1950s–1970s);
(iii) two contrasting interpretations of poplars in the contemporary city: (a) poplars as green elements in the multispecies 'green city', irrelevant of the origins; (b) poplars as signs of the negated historical-political Other and former Sovietization.

In a historical perspective the promoting of poplars has been a widespread trend, initially an aesthetic and later a political and/or economic one. However, it can be claimed that the initial aesthetic meaning persists. In the 18th century Lombardy poplars spread extensively from Italy to the rest of Europe and North America as fast-growing trees referring to the Italian landscape, villas and culture (Wood 1994: 24). While the fashion must have influenced also landscape design surrounding upper-class homes in the Baltic region at the time, Lombardy poplars have not

been widely used in Estonia, probably due to climatic reasons (Mathiesen 1938: 481; Klinge 1883: 81). The conditions are more conducive of growing some other sub-species, for example *Populus x berolinensis* that later would be used extensively. Instead, on the current territory of Estonia the significance of poplars becomes prominent later, in the 20th century, and in more pragmatic and political paradigms. A reference to Mediterranean landscapes, culture and history can instead be found in the significance of the pyramid oaks in Tartu (see also Fig. 4) – a reference to both the Neoclassical fashion of poplars in Europe and North America, as well as the Mediterranean cypresses and the Athens on the Emajõgi.

Conclusion

As we saw on the examples of pyramid oaks and poplars, trees can manifest and naturalize cultural self-descriptions and distinctions of Self and the Other. The determination of their belonging merges ecological and cultural categories. The ecological alien species paradigm strives to provide a singular foundation for the selection of urban non-human species. This can undermine the prevalent cultural models of self-description, as the examples demonstrate, while the existing models will transform the meanings stemming from the ecological paradigm.

Given the role of the city as a meeting point of various cultural codes as well as its status in cultural self-descriptions and identity, we can conclude that if a novel framework of meanings such as the ecological alien species paradigm is introduced into this setting, it inevitably interacts with the codes and meanings which have already gained a foothold in the place. On the one hand, such a collision poses a potential threat to the new paradigm due to the unwanted and unexpected associations (like the potential linking of the ecological paradigm of alien species with cultural xenophobia). On the other hand, the collision of the existing and the new frameworks will offer an opportunity for the generation of novel meanings – for example, the consideration of certain urban specimen of trees as nodes in an ecosystemic web, instead of their individual appraisal, or reevaluation of building and planning rules and habits.

In this research we focused on the relationship of cultural models, the city, and cultural meanings attributed to trees. Besides this significative role trees are involved in the ecosemiotic network of the city by symptomatic agency – by their materiality, form and life processes influencing meaning-making processes in the city. We did not discuss how the urban trees themselves relate to the particular environment, the role of non-native trees in the formation of the living environment for other species, including humans, or various interactions related to

trees. Those might be additional lines of investigation for future urban ecosemiotic studies.[8]

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Городская экосемиотика деревьев: почему экологическая парадигма чужеродных видов не прижилась в городах?

Транспортировка и перемещение видов вне их естественных сред обитания считаются одной из главных причин потери биоразнообразия в наши дни. Проблемы прибавляются также из-за урбанизации и разрушения естественных сред обитания. В то же время интеграция городской окружающей среды с усилиями по охране природы привела к тенденции применять экологическую парадигму чужеродных видов в городах. Но, как показывают практики городского озеленения, эта цель не была достигнута. В этой статье мы предполагаем, что причины этого в основном связаны со специфическими особенностями города как семиотической системы. Разнообразие кодов и субъектов различного происхождения оспариваются экологической парадигмой чужеродных видов: не самой чужеродностью видов, но спецификой данного города. Город часто выполняет функцию культурной модели, регулирования границ между S*elf* и O*ther*. В этом случае экологическая парадигма чужеродных видов встречается с различным комплексом значений, приписанных Другому. Мы демонстрируем, как две различные модели города выражены в интерпретациях «иностранных» деревьев, используя в качестве примера пирамидальный дуб и тополь в Эстонии.

Linnapuude ökosemiootika: miks võõrliikide ökoloogiline paradigma pole linnades juurdunud?

Loodusliku mitmekesisuse praeguse vähenemise üheks peamiseks põhjuseks peetakse võõrliikide sissetalumist. Samal ajal on probleemiks ka looduslike elupaikade kadu linnastumise tõttu. Looduskaitselise mõtteviisi rakendamisega linnakeskkondadele kaasneb omakorda linnade käsitlemine võõrliikide ökoloogilise paradigma valguses. Linnahaljastuse praktikatest ilmneb, et võõrliikide paradigma pole linnakeskkonnas juurdunud. Väidame, et selle põhjused on paljuski seotud linna kui semiootilise süsteemi toimimisega. Võõrliikide paradigma seab küsimuse alla koodide paljususe ja erinevat päritolu subjektide kohalolu, mis on aga iseloomulik just linna semiootilisele keskkonnale. Linn täidab sageli kultuurimudeli funktsiooni, kehastades *oma* ja *võõra* vaheliste piiride kehtestamise põhimõtteid. Ka sel juhul tuleb võõrliikide ökoloogilisel paradigmal kokku puutuda hoopis teistsuguste tähendustega, mida *teisele* omistatakse. Artiklis näitame Eesti püramiidtammede ja paplite kaudu, kuidas kaks erinevat linnamudelit kajastuvad võõrpuude tõlgendustes.