

THE GINKGO (*GINKGO BILOBA L.*) IN ESTONIA

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Abstract. The aim of this study is to analyse the historical and present distribution of the ginkgo in Estonia. The ginkgo is a species sensitive to cold, however, a few specimens have successfully acclimatized in Estonia. Their principal places of growth are various gardens and arborets. The oldest and biggest ginkgo is nearly one hundred years old and it is situated in Tallinn. Younger trees, aged from 40 to 60, grow in Tartu (Central Estonia) and Saaremaa Island. The age of the other trees varies from 3 to 17 years. The tallest among them is a tree growing in Pärnu (South-West Estonia).

The paper also gives a survey of the trees growing in the territories neighbouring on Estonia.

Key words: ginkgo, Tartu Botanical Garden, Tallinn.

INTRODUCTION

Small natural habitats of the ginkgo, the "living fossil" (Ch. Darwin), can be found in China in the mountains of Tien Mu Shan, south-east of the lower reaches of the Yangtze (about 30° N and 119° E), and in the valleys of Lung-tung-kou and Han-chia-kou, south-east of the upper reaches of the Yangtze (about 29° N and 109° E) (Li, 1955/56; Urania Pflanzenreich, 1971; Hegi, 1981).

Nowadays the ginkgo occurs in botanical gardens and arborets and in the green areas of towns. The ginkgo being a rather pollution-resistant tree (Sharma, 1989), it is often planted as a street tree, too.

The oldest and biggest trees grow in China, Korea and Japan. The longevity of these trees is associated with their immunity to insect damage and viral and fungal diseases (Major, 1967). Thus, there is a 1100 years old tree, 61 m tall and with a diameter of 4.6 m, in Korea near the Yongmun-san temple and a 700 years old tree, 15.3 tall with a diameter of 4 m, in Tokyo near the Zanpukuji temple (Tredici, 1981). One of the ancient trees the circumference of which is 14.5 m grows in the Iwate Prefecture in Japan, in the square facing the Kujis Chosenji temple (Miyoshi, 1931).

200 years old and older ginkgo trees can be found in Europe, too, mainly in Italy, Austria, the Netherlands, Germany and England, but also elsewhere. The tree that was planted in the Kew Royal Botanical Garden in London in 1762 is considered to be the oldest of European ginkgoes. In 1970 it was 21.9 m tall and its circumference was 409 cm at the height of 0.9 m, and 290 and 203 cm at the height of 1.5 m (the tree has two arms) (Mitchell, 1972). The biggest tree is probably the one in the Milano Botanical Garden. Fifty years ago its height was 40 m and diameter 1.5 m (Mathiesen, 1934). There is a tree in the

Botanical Garden of Vienna University, planted between 1770 and 1780 (Konrad Liebeswar, personal communication 1989), one in Harbke Park near Helmstedt, Germany, planted probably in 1771 (Schwerin, 1920) and one in the Dyck castle garden, planted in 1796 (Esser, 1928; Schipper, 1928). The trees in the Philadelphia forest cemetery in the United States, planted in 1784, are still growing there. The height of the male tree is 20.7 m and the diameter 76 cm; the height of the female tree is 18.3 m and the diameter 81 cm (Tredici, 1981).

In 1809 the ginkgo found its way to Russia via the Ukraine. It was first cultivated in the Osnovyantsy Acclimatization Garden. In 1811 a ginkgo was included in the list of the plants in the Kremenets Botanical Garden (Озеленение..., 1952). The first reports of ginkgoes in the St. Petersburg Botanical Garden date from 1816 (Головач, 1980) and the Nikitsky Botanical Garden acquired a ginkgo in 1818. It was Ch. Steven, the then director of the Botanical Garden, who brought the tree there (Masing, 1986) and it is still growing there (Кормилицын, 1960), celebrating its 175th anniversary in 1993.

In connection with the Baltic dendroflora the ginkgo was first mentioned by J. Klinge in 1883. Riga was given as its place of growth (*bei Riga angepflanzt*).

Several other scientists have written about the ginkgoes growing in Estonia and the present study is a sequel to the researches that have been published up to now (Boerner, 1924; Viirok, 1929, 1930a, b, 1932; Kuphaldt, 1933; Goertz, 1938, 1940; Paivel et al., 1989; Sander et al., 1990; Sander and Meikar, 1991).

DISTRIBUTION IN ESTONIA

The facts presented in this review were gathered by J. Elliku at the beginning of the 1980s and by the author at the end of the eighties (Paivel et al., 1989; Sander et al., 1990) and the beginning of the nineties.

First news about the ginkgoes in Estonia derive from Tartu and Tallinn. According to the information obtained by N. I. Kuznetsov, the director of the Botanical Garden of Tartu University (Кузнецов, 1900; Tänavots, 1976), ginkgoes had been cultivated in the greenhouse of the Tartu Botanical Garden since 1833.

In 1897 a ginkgo was planted in the open for the first time. In winter the tree was covered with straw and it easily survived the winters of 1897/98 and 1899/1900 (Кузнецов, 1900; Boerner, 1924). Unfortunately there is no further information about this tree.

According to F. Bucholtz, the director of the Botanical Garden (1923), two trees were growing in the open, one of them in the geographical department (China) and the other in the systematic department. According to F. Boerner (1924), one of the gardeners at the Botanical Garden, a 1.5 m tall ginkgo was growing in the home garden of the university lecturer J. Rüütel. During four winters it had been left uncovered as it was sheltered by the western wall of the house. The ginkgo was brought as a potted plant from the Botanical Garden of Tartu University where it had been growing in a cold greenhouse. Further information about the three trees mentioned above is lacking.

At the moment two ginkgoes are growing in the open in the Botanical Garden of Tartu University. The trees stand in the shade. The bigger one is more than 60 years old. It was transplanted from the cold greenhouse into the open in 1932 (Veski, 1953). T. Lippmaa (1937), too, refers to this tree in his survey. In 27 years (1961–1988) the trees grew 1.87 and 1.55 m (see Table).

Results of measurement of ginkgo trees (Viirk, 1932; Paivel, 1958;
Paivel et al., 1989; Sander et al., 1990)

Site	Height, m	Dia- meter, cm	Year	Increase of the trees			
				in the height absolute, m	average per year, cm	in the diameter absolute, cm	average per year, mm
Tartu Botanical Garden (2 trees)	1.2 (A)	*	1961				
	2.5 (B)	2	1961				
	2.75 (A)	*	1988	1.55	6		
	4.37 (B)	7	1988	1.87	7	5	2
Tallinn, Viruvärvamae Park	4.0	6	1928				
	5.5	9	1955	1.5	6	3	1
Tallinn, Süda Street	6.0	10	1928				
	8.2	28	1955	2.2	8	18	7
	8.5	35	1965	2.5	7	25	7
	9.2	46	1983	3.2	6	36	7
	11.4	50	1992	5.4	8	40	6

* No data available.

Key words: ginkgo, Tartu Botanical Garden, Tallinn.

DISTRIBUTION IN ESTONIA

INTRODUCTION

Tallinn discovered the ginkgo at the beginning of the 1860s. Mr. Grigoroff, who later became the head gardener of Tallinn (he held the post in 1872—1896), exhibited a ginkgo together with other ornamental trees at a horticultural show in 1862 (Ackermann et al., 1863).

The following information about the ginkgoes in Tallinn derives from Eduard Viirk (1903—1937), one of the most outstanding young Estonian dendrologists of that time. In the summer of 1928 and 1929 he inventoried for the first time the dendroflora of Tallinn (he had been awarded a scholarship by the city) (Viirk, 1932; Vilbaste, 1938). He registered three ginkgoes in Tallinn in 1928. One tree, 6 m tall and with a 10 cm diameter at breast height, was growing in E.-G. Kühnert's garden at 2 Süda Street (Photos 1 and 2); another (4 m, Ø 6 cm) in Viruvärvamäe Park and the third (1.5 m tall) in the home garden of G. von Sievers at 3 Wismari Street (Viirk, 1929, 1930a, b, 1932). At the request of the forest inspector Heinrich Kühnert (1848—1904) the first two trees were brought from Germany towards the end of the previous century and he planted one of them in his own home garden. The garden had been founded by his father Wilhelm-Christoph Kühnert (1819—1891), the head forester of Tallinn in 1864—1884, and it was renowned in Tallinn for its apple orchard and different species of ornamental trees. But first and foremost the father and the son, Wilhelm-Christoph and Heinrich Kühnert, made a name for themselves with their notable silvicultural and horticultural activities in Tallinn (Dietrich, 1865; Sander et al., 1990; Sander and Meikar, 1991). Quite probably the ginkgo was planted in the spring of 1898. E. Kühnert, H. Kühnert's son, mentioned

in 1928 that the tree had been planted about 30 years ago. The year 1898 also coincides with the opening of Viruvärvamäe Park; 55 ornamental trees and bushes were planted there that spring (Viirok, 1930a, 1932) many of which may have been bought in Germany.

The second ginkgo was planted in Viruvärvamäe Park by Hugo Walker, the head gardener of Tallinn in 1896–1907 (Kühnert, 1930; Viirok, 1932). It grew in the shade of a Manchurian walnut tree. Apparently the place of growth did not suit it since it grew up wry and crooked. In 1955 the height of the tree was 5.5 m and the diameter of the trunk was 9 cm. The tree perished in 1956 (Paivel, 1958; Kenkmaa and Vilbaste, 1965; Sander et al., 1990).

The third tree, that in the home garden of G. von Sievers at 3 Wismari Street, came from Riga. Every winter it was wrapped up in straw in order to protect it from the cold. Its later destiny is unknown; it probably perished in the extremely cold winter of 1939/40.

The tree planted by H. Kühnert in his garden still exists and is growing at present in the green area at the corner of Süda Street and Pärnu Road. In 1913, when part of the garden was destroyed by the newly laid-out street, the architect Ernst-Gustav Kühnert (1885–1961), H. Kühnert's son, transplanted the ginkgo in its present location, near the end wall of his dwelling house (Kühnert, 1930; Viirok, 1932; Sander and Meikar, 1991).

While in 1928 the height of the tree was 6 m and the diameter of the trunk at the height of 1.3 m was 10 cm, in 1955 the height was 8.2 m and the diameter, 28 cm (Viirok, 1932; Paivel, 1958). When we compare the measurements of the tree in Viruvärvamäe Park with those of this one we see that in 27 years (1928–1955) the trees gained 1.5 and 2.2 m in height and 3 and 18 cm in diameter, respectively (the Table).

In the years 1955–1992 the tree in Süda Street gained 3.2 m in height and 22 cm in diameter, and in 1928–1992 the tree has grown 5.4 m taller and its diameter has increased by 40 cm (the Table).

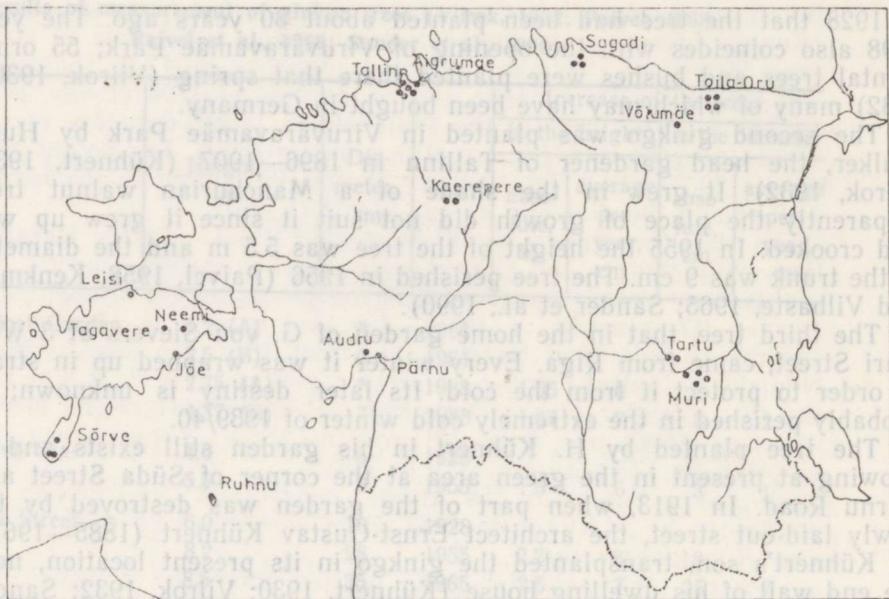
In addition to the above-mentioned ginkgo four private gardens in Tallinn can boast of having some small ginkgoes. The trees are under 10 years old and around 0.5 m tall. The Tallinn Botanical Garden has also got two small plants.

Several other ginkgoes are known to have grown in Tallinn in the past (Sander et al., 1990). Thus, in the 1930s the gardener K. Reala (his former name was Reim) (1892–1970) obtained four trees from Germany and planted them in his own nursery garden that had been founded already in 1903 by his father T. Reim (1853–1938). The trees were registered in the middle of the fifties by A. Paivel (1958).

Since in 1965 the garden had to be liquidated (it got in the way of some planned buildings) two trees were sent to the Tallinn Botanical Garden. They were nearly 30 years old at that time, the bigger one was 3.95 m tall and its diameter was 7 cm. The trees were planted near a ditch with fatal consequences: water rats destroyed their roots. One tree perished in 1967 and the other in 1970. The other two trees were taken to Saaremaa and additional data about them could not be found (Sander et al., 1990).

For nearly 15 years Fr. Tuglas (1886–1971), a well-known Estonian writer, had a ginkgo in his home garden in Tallinn's suburb Nõmme. The tree was given to him as a present at the end of the 1950s and it perished after the death of Fr. Tuglas in the winter of 1971/72 because it had been very inexpertly covered.

Outside Tartu and Tallinn nearly 35 ginkgoes in 15 different places are known in Estonia (Figure). Quite a few of them grow in the western part of Estonia, in the island of Saaremaa — 17 trees in six locations.



Distribution of *Ginkgo biloba* L. in Estonia.

The oldest tree is probably over 50 years old. It grows in the arboretum founded in the 1920s and '30s by M. Rand (1871–1958) in the village of Neemi in Saaremaa (Paivel, 1955, 1959). As a result of unfavourable conditions of growth the tree is relatively small. According to A. Paivel the tree was 1 m tall in 1955; in 1963 it was also 1.0 m tall according to L. Raid and in 1987 it was 1.6 m tall (Sander et al., 1990).

The next in age after the tree in Saaremaa are four 21 years old trees at Toila-Oru in the north-eastern part of Estonia; they were brought from Sukhumi (western Caucasus) in 1972.

The oldest of the rest of the Estonian ginkgoes are 10–12 years old but most of them are still younger. The tree in Pärnu in the home garden of K. Merilo is the biggest. It was brought from Latvia in 1982. The height of the tree is 3 m (Dec. 5, 1992). In the spring of 1989 and in January 1991 an about 30 cm piece of the treetop was stolen. In both cases apical growth was restored. The tree in the garden of U. Erik's summer home in the village of Muri near Tartu is also 12 years old. The tree is 1.62 m tall (Jan. 10, 1991). It was cultivated from the seed obtained from the Sukhumi arboretum in 1980.

The other trees of the same age or younger are around 0.5 m tall.

In the past ginkgo trees have grown in the Tihemetsa arboretum, Pärnu district (Kivilild, 1939; Mitt, 1986), in Valga (Goertz, 1938; 1940) and in Põltsamaa. The height of the nearly 20-year-old Põltsamaa tree was 1–1.5 m. It perished in the middle of the 1970s. The two ginkgoes in Valga, in the garden of J. Goertz (1938; 1940), were the only survivors of several trees grown from seed. They survived the severe winter of 1939/40 when the temperature dropped to -42°C ; only the tips of young shoots froze. The destiny of the trees is unknown. There was also a ginkgo near Audru church in Pärnu district (in the years 1982–1988; it was destroyed by rodents) and some trees in other places in Estonia (Sander et al., 1990).

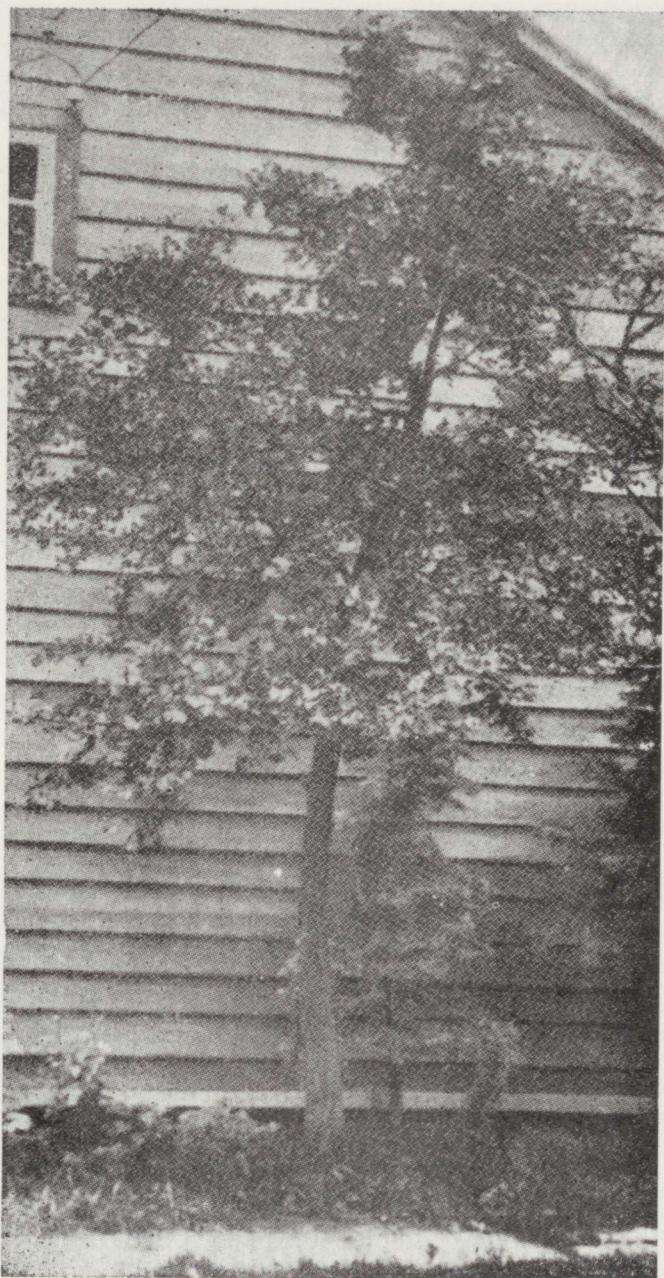


Photo 1. The ginkgo in Süda St. in 1928 (photo by Viirok, 1932).



Photo 2. The ginkgo in Süda St. in 1992 (photo by the author).

DISCUSSION

In spite of the fact that ginkgoes can grow in Estonia, longevity of the trees in Estonian climate is exceptional. The ginkgo neither blossoms nor fruits here (Eichwald, 1960). It has also been noted that the shoots of one vegetation period have not enough time to lignify completely and the unligneous part of the treetop dries up. Consequently the growth is rather slow.

The specimens that were brought from Germany before World War II have been more fortunate. Urban conditions in general are favourable to the growth of ginkgoes. A vivid example of it is a tree that grows in the "heat belt" of Tallinn where the winter temperature is several degrees higher than in the surrounding areas and the vegetation period longer (Tarand, 1986).

Ü. Erik has been the leading cultivator of ginkgoes in Estonia since 1978. He has also distributed the trees in Estonia, sending them to Tartu, Tallinn, Saaremaa and elsewhere. He has mainly experimented with seeds from Sukhumi. For example, in the 1980s one-eighth of the seedlings cultivated from the same consignment of seeds turned out to be surprisingly frostproof. The trees that developed from these seedlings are growing in several places in Estonia at present (Sander et al., 1990).

Some seedlings are growing in Pärnu at present; the seeds were bought in a Darmstadt seed shop in Germany in January 1991.

The ginkgo also grows in areas neighbouring on Estonia, for instance, in Finland. The Turku Botanical Garden has a tree that was planted there in 1983. The height of the tree is 2.55 m and the diameter 9 cm (Alanko, 1989; Karhu, 1989).

In Moscow ginkgo trees thrive in the Biryulev dendropark, in the territory of the Exhibition of Economic Achievements and in the Botanical Garden of the Academy of Sciences of Russia (Древесные..., 1975; Якушина, 1982). The height of the biggest tree, aged 30, was 3.5 m and the diameter, 8 cm (Якушина, 1982).

The trees in the Botanical Garden are probably the oldest. Some of them came from Potsdam in 1946 as 3-years old plants, the others were cultivated from the seedlings obtained in Pyatigorsk in 1952 (Древесные..., 1975).

The collection of the St. Petersburg Botanical Garden includes ginkgoes that are older than 40 years. They were cultivated from the seeds brought from Tbilisi in 1946. The height of the four trees varies from 2.8 to 7.2 m and the diameter of the trunks, from 4.3 to 12 cm. The biggest of the trees stands in a sunny place near a large palm house and is protected from the northern and eastern side. The seedling that had been growing in the greenhouse since 1947 was planted out in 1962 when it had turned into a 2 m tall tree (Комарова, Замятнин, 1990).

The oldest ginkgoes in Latvia grow in Riga. Of the five trees (all of them female) four are reported to be 35—80 years old and 5—12 m tall and to have a diameter of 6—56 cm (Мауринь, 1970). Three of the trees stand near a town canal in the green area founded by G. Kuphaldt (1853—1938), a city gardener in 1879—1914 (Kaaver, 1978). The oldest ginkgo, more than 110 years of age, is connected with the person of G. Kuphaldt. At the beginning of the 1880s planting experiments with this tree started (Kuphaldt, 1932). In all likelihood J. Klinge (1883) referred to the same tree because his information about it came directly from G. Kuphaldt. According to G. Kuphaldt (1915) the height of this two-armed female tree was nearly 4 m and at the latest 5 m (Kuphaldt, 1932). More recent information about the two-armed tree is that its

height is 13 m and the diameters 57 and 46 cm (Cinovskis et al., 1986). The ginkgo blossoms periodically (every 2—4 years) but fruits never ripen due to the absence of a male tree (Maurinš, 1982).

The biggest tree in Lithuania is in Svekšna Park. The height of the tree is 17 m and the diameter of the trunk 50 cm (Dendrologija, 1973).

There are 23 trees in the city and province of Kaliningrad (Königsberg), 10 of them in the city. The biggest tree grows in the Zoo of Kaliningrad; it is 18 m tall and has a 57 cm diameter (Конспект..., 1983). The tree was registered by F. Schwerin (1922) already in 1922 together with the other ginkgoes of Kaliningrad.

On the ground of phenological observations carried out in the St. Petersburg Botanical Garden V. N. Komarova and B. N. Zamyatnin (Комарова, Замятнин, 1990) regard the ginkgo as a tree that belongs to the second and third grade of winterhardiness (according to P. I. Lapin). Accordingly (Лапин, 1967), more or less 50% (depending on winter) of the shoots of the ginkgo trees will freeze in winter. The above-mentioned authors also note that St. Petersburg can be regarded as the northernmost area where the ginkgo still has an arborescent form.

The ginkgo in Estonia is also considered to be in the second grade of frosthardiness (Paivel, 1958). According to Paivel, in severe winters last-year shoots suffer most.

Considering the fact that the ginkgo grows in Moscow (Якушина, 1982), St. Petersburg (Комарова, Замятнин, 1990), Estonia, South Finland and Stockholm (Alanko, 1989), the border of the hemiboreal and southern boreal vegetation zones (Ahti et al., 1968) may be regarded as the border of the area of occurrence of the ginkgo. South of the border the trees may grow under favourable conditions for many decades.

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HÖLMIKPUU (*GINKGO BILOBA* L.) LEVIK EESTIS

Heldur SANDER

On kirjeldatud hölmikpuu ajaloolist ja praegust levikut Eestis. Kuigi see liik on külmahell, on üksikud hölmikpuu isendid Eestis siiski aklimatiseerunud. Põhilised kasvupaigad on mitmesugused aiad ja dendraariumid, kus kasvab kokku 43 isendit üksikute puude ja väikeste taimekestena. Vanimaks ja suurimaks on ligi 100-aastane puu Tallinnas. 40—60 aasta vanuseid puid kasvab Tartus ja Saaremaal. Ülejäänud puude vanus on 3—17 aastat ning nende seas on kõrgeim Pärnu linnas kasvav puu.

Kirjanduse põhjal on antud ülevaade Eesti naaberaladel kasvavatest hölmikpuudest.

GINKGO BILOBA L. — РАСПРОСТРАНЕНИЕ В ЭСТОНИИ

Хелдур САНДЕР

Дается исторический обзор о распространении гинко в Эстонии. Несмотря на то, что этот вид страдает от мороза, в Эстонии несколько деревьев все же акклиматизировалось. Всего насчитывается 43 дерева и маленьких деревца, которые в основном растут в садах и дендрариях. Самым большим и старым является почти 100-летнее дерево, растущее в Таллинне. В Тарту и на о. Сааремаа растет много 40—60-летних деревьев. Основную массу составляют 3—17-летние деревья — из них самое высокое растет в Пярну.

На основе литературы приводится также обзор деревьев гинко, растущих на соседних с Эстонией территориях.