

The immigration and distribution of *Iva xanthiifolia* Nutt. in Lithuania

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ABSTRACT: Immigration, distribution and possibilities of naturalization of *Iva xanthiifolia* Nutt. in Lithuania were studied.

KEYWORDS: *Iva xanthiifolia*, immigration, distribution, Lithuania.

Introduction

In every part of the world there is virtually no flora without some species which are not native to the area. In Europe one of such species is *Iva xanthiifolia* Nutt. (*Cyclachaena xanthiifolia* (Nutt.) Fresen.) - a North American plant.

The genus *Iva* L. contains 15 species, distributed in North and South America (JACKSON 1960, GLEASON 1963). *I. xanthiifolia* is native to North America and grows on sandy and silty river alluvials, in dry river and stream beds. As a weed it is very common on moist waste places and arable fields, too (GLEASON 1963, GUZIK and SUDNIK-WÓJCIKOWSKA 1989). In secondary area this species occurs in ruderal and segetal habitats (NIKITIN 1983).

In Europe this genus is represented by one alien species - *I. xanthiifolia*. First it was planted in Botanical Gardens. In 1842 the species was first reported as having escaped from Kiev University Botanical Garden and dispersed in ruderal habitats. As a segetal weed, *I. xanthiifolia* was first found in 1925 in the Ukraine (NIKITIN 1983, GUZIK and SUDNIK-WÓJCIKOWSKA 1989). Later it has spread throughout the Ukraine and neighbouring regions of Russia, also as a ruderal and/or segetal weed in other south European countries:

Czechoslovakia, Hungary, Romania, South Germany, Austria, France etc. (HANSEN 1976). At present the species occurs in southern regions as naturalized, while in northern as a casual adventive. The detailed notes on the history of this species immigration and distribution in Europe is given by GUZIK and SUDNIK-WÓJCIKOWSKA (1989).

In spite of the fact that *I. xanthiifolia* occurs in Lithuania as a casual species, it is interesting to analyse its immigration, distribution and possibilities of naturalization in our Republic. In the neighbouring countries - Poland (GUZIK and SUDNIK-WÓJCIKOWSKA 1989) and Byelorussia (TRETYAKOV 1990) such investigations have already been made.

Material and methods

The investigations were carried out in 1987-1990 on the whole territory of Lithuania. Railway stations and adjacent areas, grain mill yards, dumps etc. were investigated, and over 50 specimens of *I. xanthiifolia* were collected by the author. The herbarium material of *I. xanthiifolia* deposited in the Herbarium of the Institute of Botany of the Lithuanian Academy of Sciences (Vilnius, BILAS) and in the Herbarium of the Department of Botany and Genetics of Vilnius University (Vilnius, WI) has been studied too. All the specimens collected by the author will be deposited in BILAS.

The exact year of the first record of *I. xanthiifolia* in Lithuania was determined according to the data on the herbarium specimen sheets, because the information has not been given in the literature.

In the map, all localities, distance among which is more than 5 km, or those divided by natural barriers (rivers, etc.) are marked by separate points.

Results and discussion

The first record of *I. xanthiifolia* in Lithuania was made in 1947 in Kaunas (Kaunas, Freda, on railway embankment slope, 20 September 1947, P. Snarskis (WI)). In the same year it has been found also in Vilnius (Vilnius railway station yard, on railway embankment, 27 September 1947, P. Snarskis (BILAS)). In Vilnius *I. xanthiifolia* was also found in 1948 and 1963, in Kaunas - in 1948 (specimens in BILAS, WI). For a long time only these two localities were known in Lithuania and reported in references (SNARSKIS 1954, 1968, KIZIENĖ 1980).

The new records of *I. xanthiifolia* in Lithuania were made only 16 years later. The species was found in 1979 in Kretinga

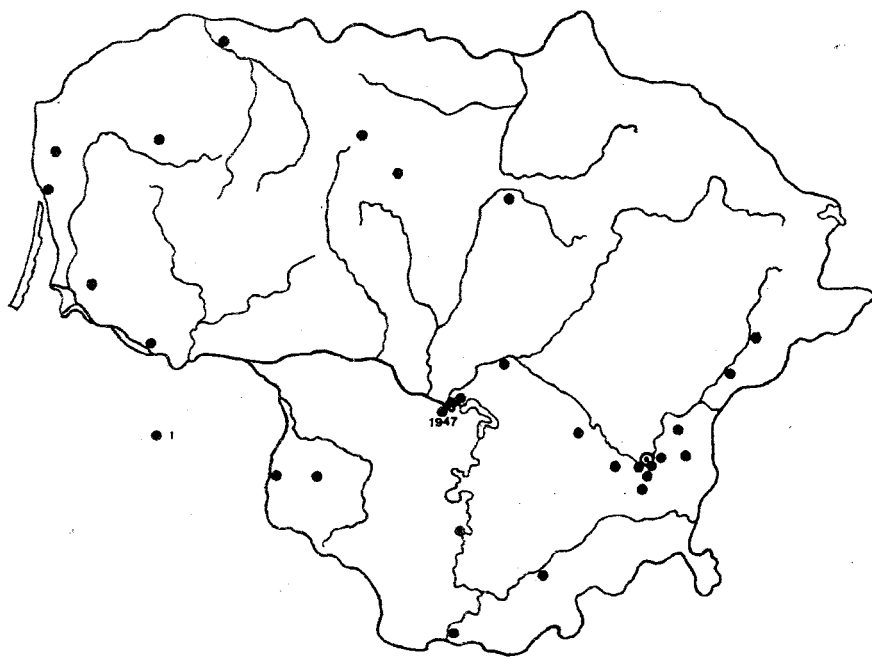


Fig. 1. Distribution of *Iva xanthiifolia* in Lithuania (1). 1947 - year of the first record.

(LEKAVIČIUS 1982), and in 1984 in Šiauliai (MOTIEKAITYTĖ 1985) in railway station yards. In 1984 this species was also found in Varėna by A. Lekavičius (specimen in BILAS), but this locality has not been published until now.

After investigations in 1987-1990 which were made by the author in ruderal habitats in Lithuania, over 50 records of *I. xanthiifolia* in 29 towns were revealed. Now this species in Lithuania is found in Alytus, Bezdonys (Vilnius distr.), Druskininkai (Varėna distr.), Freda (city of Kaunas), Gaižiūnai (Jonava distr.), Kaunas (railway station), Kirtimai (city of Vilnius), Klaipėda, Kretinga, Kybartai (Vilkaviškis distr.), Lentvaris (Trakai distr.), Mažeikiai, Mickūnai (Vilnius distr.), Naujoji Vilnia (city of Vilnius), Pabradė (Švenčionys distr.), Pagėgiai (Šilutė distr.), Palmonas (Kaunas), Paneriai (city of Vilnius), Panevėžys, Plungė, Radviliškis, Šiauliai, Šilutė, Švenčionėliai (Švenčionys distr.), Varėna, Vaidotai (Vilnius distr.), Vievis (Trakai distr.), Vilkaviškis, Vilnius (railway st.) (Fig. 1).

The northern border where *I. xanthiifolia* is naturalized, lays in South-East Poland and southern regions of Byelorussia (GUZIK and SUDNIK-WÓJCIKOWSKA 1989, TRETYAKOV 1990). Further to the North this species is rather casual and could not persist for longer time without repeated introductions. In the neighbouring countries, *I. xanthiifolia* occurs in Latvia (found for the first time in 1960) (TABAKA et al. 1988), Estonia (first record in 1958) (REMEL 1978). The northern records were made in Finland (in 1932 in Tampere) (SUOMINEN 1979).

At present, *I. xanthiifolia* occurs in Lithuania as a casual plant only in ruderal habitats, which are closely connected with transport and processing of imported grain or other agricultural production, i.e. at railway stations, grain mills etc. Among 66 records of this species in Lithuania, 52 have been found in railway station yards (35 in interrail and/or intertrack areas, more rare on embankment slopes, 17 near storehouses or storehouse ramps), 7 in grain mill yards, 4 in dumps, 2 in waste places, 1 in sea-port yard. *I. xanthiifolia* is probably introduced directly from North America with imported grain (maize, wheat) and/or from its secondary area, i.e. from the south-western part of the USSR with grain or other agricultural production (possible with fruits, vegetables, etc.).

I. xanthiifolia quantity at all localities in different years was more or less constant. In most cases a small amount (1-10) of individuals was found. Rarely, mostly at large railway station yards and near grain mills its quantity proved to be higher (20-30, or more individuals). Plants are sparsely dispersed over these localities.

The flowering of *I. xanthiifolia* in Lithuania begins in the second part of August and it is in progress till the first autumn frosts. All plants found in July were in vegetative condition. Separate individuals do not begin to flower till the end of the vegetation period. The plants which begin to flower in August are rarely able to give ripe seeds. *Iva xanthiifolia* with ripe seeds has only been found a few times: in Vilnius (1963 October), Klaipėda (1988 September), Kirtimai (city of Vilnius) and Mickūnai (Vilnius distr.) (1990 September). I am sure that only once in 1989 *I. xanthiifolia* developed from seeds ripened in our Republic was found in Bezdonys (Vilnius distr.), on railway embankment (about 40 individuals). They covered a close area around the remains of the last year plant.

In investigating *I. xanthiifolia* in Lithuania the author noticed that plants vary in some traits, mostly in leaf form (from ovate to lanceolate) and in leaf-margin (from sparsely to doubly serrate). It is

possible that these differences are a result of different provenance of seeds immigrating into our Republic. Maybe that plants having grown from seeds introduced from the secondary distribution range of *I. xanthiifolia* differ from those which developed from seeds of North American origin. In order to confirm the above suppositions, it is necessary to make detailed investigations based on a great number of specimens from South Europe and North America.

The particular investigations on *I. xanthiifolia* in Lithuania indicated that this species occurs as a casual ruderal weed. At present it cannot spread freely without new introductions. The climatic conditions are not favourable for wider naturalization and distribution of *I. xanthiifolia* in the Lithuanian territory. We suppose that this species has a possibility for more or less local establishment in ruderal habitats, but it is necessary to carry further investigations on this species' reproduction.

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