## TODAY AND TOMORROW OF *IMPATIENS* INVASIONS IN RUSSIA

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**Introduction.** Genus *Impatiens* includes about 1000 species, growing mainly in mountains of tropical Africa and Asia, with only dozen or so native species in northern temperate zone. Many of these plants have beautiful flowers and are cultivated as ornamental plants. Some of them escaped from culture and several became important invaders in different parts of the world (Adamowski, 2008). Russia is not exception, but even newest publications (Vinogradova et al., 2018) don't include complete information on the state and possible future of *Impatiens* invasions in the country. There were many erroneous records of *Impatiens* species from different regions of Russia.

**Materials and methods.** Authors critically reviewed available literature and other sources (iNaturalist and Plantarium portals, Moscow Digital Herbarium, other GBIF-mediated electronic resources, correspondence with colleagues-botanists working in particular territories) to produce maps of invasion status of *Impatiens* species present on the territory of Russia on the level of federal subjects (oblasts, krais, republics, etc.). Authors used terms: „casual" for geographically non-native plants observed as transitory elements of flora, „naturalized" for geographically non-native plants thriving in disturbed habitats and „invasive" for geographically non-native plants encroaching into natural vegetation. In some cases status of plant in particular territory was impossible to ascertain – „undefined".

**Results.** Five *Impatiens* species are present in different stages of naturalization in Russia. Himalayan *I. glandulifera* is Most widespread (found in 71 out of 81 territories) and clearly invasive spreading in majority of European Russia (Vinogradova et al., 2018), Caucasus (Zernov, 2013), southern Siberia and parts of Russian Far East (Vinogradova et al., 2018). Second Central Asiatic *I. parviflora was* found in 51 territories, also invasive and distributed mainly in European Russia (Vinogradova et al., 2018), with more recent observations in Caucasus (Zernov, Filin & Adzhiyev, 2019), Russian Far East and southern Siberia (Vinogradova et al., 2018). *Impatiens balsamina* (was found in nine territories) from southern and southeastern Asia should be treated as casual both in Caucasus (Zernov, 2013) and Middle Russia (Seregin, 2012). East African *I. walleriana* was reported from Caucasus as casual (two territories) (Zernov, 2013). Another Himalayan species, *I. balfourii* was found in Moscow oblast, also as a casual.

North American *I. capensis* is present in neighboring countries: Finland, Poland and Japan (Adamowski, 2008). Three more Himalayan balsams were recently observed as at least naturalized plants in northern temperate zone: *I. edgeworthii* in Germany, *I. tricornis* in Italy, Austria and Netherlands, as well as *I. bicolor* in Oregon, USA. Spontaneous hybrid *I. balfourii* × *I. parviflora* was recently found in Switzerland.

**Conclusion.** Non-native balsams do not occur in Russia only in regions with very harsh climate (with short and cold summers – Nenets AO, Yamalo-Nenets AO, majority of Krasnoyarsk Krai and Yakutia, whole Chukotka and Magadan oblast or northern part of Khabarovsk Krai, as well as in dry part of Caucasus and adjoining steppes and semi-deserts – Dagestan, Chechenia, Ingushetia, Kalmykia, or Astrakhan and Volgograd oblast). Tropical *I. balsamina* and *I. walleriana* occur only as casuals, whereas *I. glandulifera* is coming from

high altitudes in Himalaya and invades also high latitudes. Four out of five non-native balsams are occuring in Russia annually, only *I. walleriana* is perennial in native distribution. New records of particular species for particular territories were collected over time. Introduction of new taxa into culture, global trade and ongoing climate change lead to appearance of further species out of cultivation that seems to be inevitable.

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