

# Small Balsam, *Impatiens parviflora* (Balsaminaceae): A new alien species to the flora of Bosnia and Herzegovina

Semir Maslo<sup>1</sup> & Šemso Šarić<sup>2</sup>

<sup>1</sup> Primary School, Lundåkerskola, Gislaved, Sweden, e-mail: semmas@edu.gislaved.se  
(corresponding author)

<sup>2</sup> Jelaške, Olovo, Bosnia and Herzegovina, e-mail: semsosumar@gmail.com

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**Abstract.** Small Balsam, *Impatiens parviflora*, was discovered in August 2018 during fieldwork in the valley of river Bosna, near the old town of Vranduk (Central Bosnia). This is the first record of this species for Bosnia and Herzegovina. The paper presents a short morphological description and photographs of the species based mainly on the collected specimens, as well as information on the distribution of the taxon.

**Key words:** alien species, distribution, morphology, naturalization, Small Balsam.

## Introduction

The genus *Impatiens* (Balsaminaceae) contains about 1000 species distributed in Europe, North and Central America, North Asia, Himalaya, India to China, New Guinea, tropical Africa and Madagascar (Fischer 2004). It is represented by eight species in the European flora, of which only one is native (Valdés 2012). In the flora of Bosnia and Herzegovina, four species of the genus *Impatiens* have been recorded so far: one native – *I. noli-tangere* L. (Beck-Mannagetta 1920), and three alien – *I. glandulifera* Royle. (Malý 1935), *I. balfourii* Hook. f. (Bucalo & al. 2007) and *I. balsamina* L. (Maslo 2016). *I. parviflora* was found during fieldwork conducted in Central Bosnia in 2018. The species is a new alien to the flora of Bosnia and Herzegovina.

## Material and methods

Digital photographs and GPS coordinates were taken in the field. The specimens were identified according to Moore (1968), Grey-Wilson (1997) and Verloove

(2012). The nomenclature follows Valdés (2012). The specimens were collected and stored in the Herbarium of the National Museum of Bosnia and Herzegovina (SARA).

## Results and discussion

*Impatiens parviflora* DC., in Prodr. 1: 687. 1824, also known as Small Balsam, is native of Central Asia and widely naturalised in temperate Europe (Coombe 1956, Trepl 1984, Hultén & Fries 1986, Valdés 2012).

For identification of this new for Bosnia and Herzegovina species, we offer an adjusted key according to Moore (1968), Grey-Wilson (1997) and Verloove (2012).

1. Flower-stalks very short, certainly not exceeding 5 mm, capsule densely hairy . . . . . *I. balsamina*
1. Flower-stalks at least 15 mm long, capsule glabrous . . . . . 2
2. Leaves opposite, or in whorls of 3 or more. Sepal spur 2–7 mm long, strongly bent . . . . . *I. glandulifera*

2. Leaves alternate, occasionally some almost opposite . . . . .
3. Flowers pink and white. Spur 10–18 mm long, straight or slightly bent . . . . . *I. balfourii*
3. Flowers creamy or yellow . . . . .
4. Flowers no larger than 18 mm, petals creamy or pale-yellow. Spur straight or slightly bent . . . . . *I. parviflora*
4. Flowers at least 20 mm, yellow, with or without brown spots. Spur curved markedly . . . . . *I. noli-tangere*

*I. parviflora* (Fig. 1) is an erect annual herb 20–100 cm tall, glabrous except for scattered stalked glands on the upper parts. The stem is either simple or branching from the axis of the cotyledons and the lowest leaves, translucent and widening at the nodes. Leaves, except for the first pair, alternate, ovate, acuminate, serrate with stalked glands at the margin basally, teeth acute, directed forward. Inflorescences in the upper leaf axils, 4–12 flowered. Flowers zygomorphic, 7–15 mm long, including the spur; perianth pale-yellow, occasionally white, and the throat darker-yellow with thin red patterns. The capsules 15–25 mm long, glabrous and narrowly club-shaped. The fruits explosive, with 1–5 seeds; the seeds oblong, brown, 3–5 mm long with fine longitudinal striations. Chromosome numbers,  $2n=20, 24, 26$  (Coombe 1956).

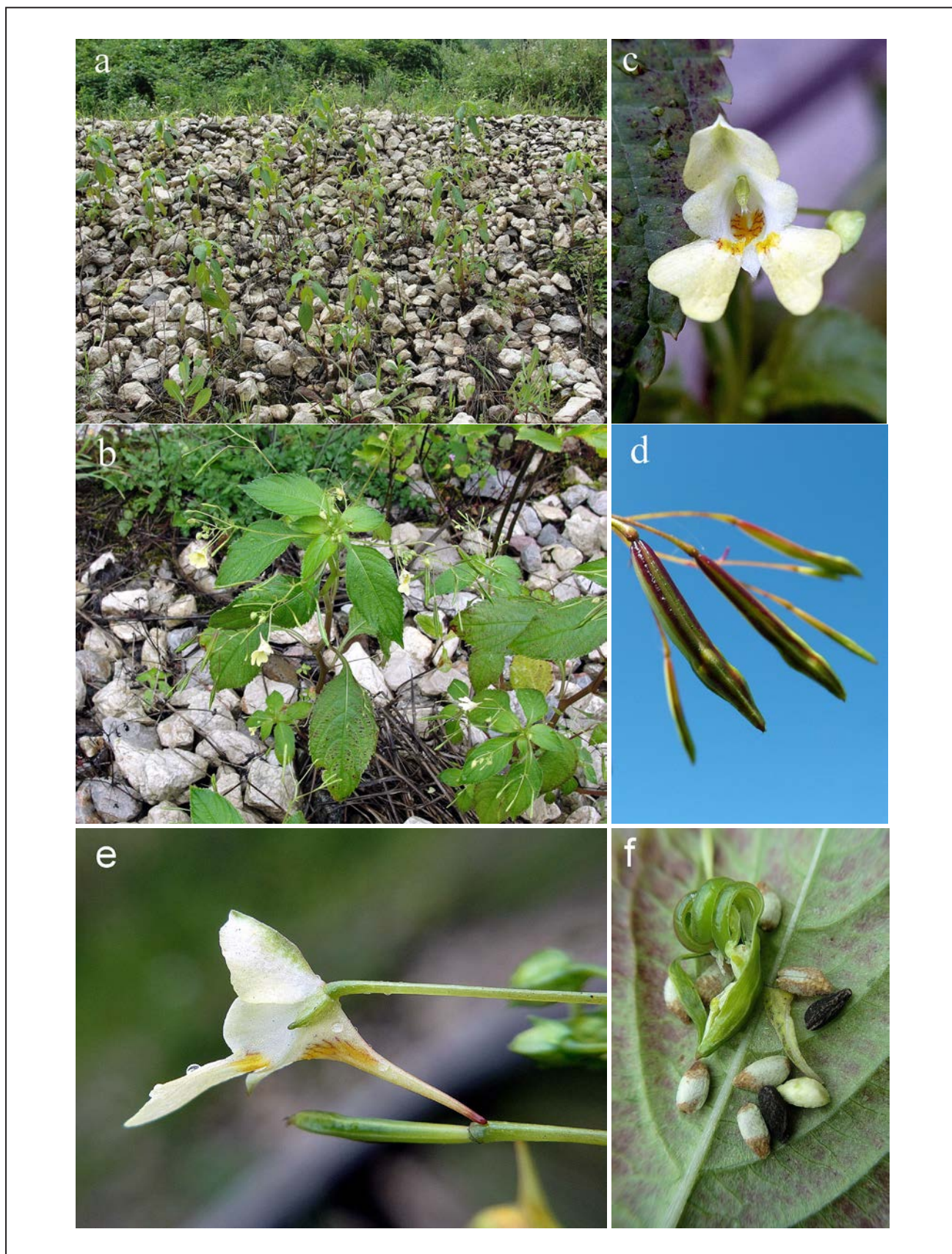
According to literature (Coombe 1956; Trepl 1984; Hultén & Fries 1986), the species originates from the mountains of Central Asia. Outside its native range, it is reported from most European, with the exception of some Mediterranean countries (Valdés 2012), southern Siberia (Shaulo & al. 2010; Sheremetova & Ebel 2017), Russian Far East (Vorosilov 1966; Prokopenko 2013), and seldom from North America (Barkworth 1973; Hill & Blaney 2009; Rohrer 2017). All European populations possibly originate from a single introduction (Coombe 1956). *I. parviflora* is referred to as invasive in most of Europe (Eliáš 1997; Tanner 2008; Branquart & al. 2010; Petrova & al. 2013; Matthews & al. 2015; Tyler & al. 2015).

The first finding of this species for Bosnia and Herzegovina came from Central Bosnia, in early August 2018, near Vranduk (44° 16' 26.92" N; 17° 52' 49.83" E; elevation 308 m.) (Fig. 2). In that area, it grew on the track embankments along the railway line Zenica – Vranduk, about 4 km southwards

of Vranduk town. About seventy specimens were recorded along the rail tracks on a linear distance of about 100 m. *I. parviflora* occurs in Europe mainly in forests and along forest edges, which is its principal habitat (Tanner 2008). The species occurs also among ruderal vegetation in the settlements. The habitat noted in C Bosnia, on the track embankments along the rail tracks, belongs to the secondary tolerated habitats (Tanner 2008). It is yet unknown how this species was introduced to Bosnia and Herzegovina. Most likely, it was introduced in C Bosnia with the dirt on logs transported by trains from the neighbouring countries. Although the species is included in the preliminary checklists of invasive alien plant species (IAS) in all neighbouring countries – Croatia (Boršić & al. 2008), Montenegro (Stešević & Petrović 2010) and Serbia (Lazarević & al. 2012), as well as recently found in Albania (Barina 2017) – its invasive status of the species in Bosnia and Herzegovina is still unclear. According to Richardson & al. (2000) and Pyšek & al. (2004), the observation period is too short to claim and declare for naturalized status this species. Therefore, it should be considered an alien casual, prior to further field investigations for proper status attribution. The potential invasive characteristics of this species calls for monitoring in the coming years.

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**Fig.1.** *Impatiens parviflora* on track embankment along the railway line Zenica – Vranduk: **a.** naturalized habitat, **b.** whole plant, **c.** flower, **d.** capsules, **e.** side view of the flower, **f.** seeds (Photographs by Šemso Šarić, except for photograph d. by Semir Maslo).



Fig. 2. Distribution of *Impatiens parviflora* in Bosnia and Herzegovina.

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