

## Short communication

# First record of naturalization of *Erechtites hieraciifolius* (L.) Raf. ex DC. (Asteraceae) in Italy

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**Abstract** - The plant species *Erechtites hieraciifolius* (Asteraceae) is here reported for the first time in Italy as a naturalized neophyte in the Classical Karst. The species was observed in 2023 in post-fire forest areas burnt by wildfires in the summer 2022. The features of findings suggest for a naturalization of the species with putative invasive character. This novel occurrence highlights the need for additional research to better understand its colonization and expansion, suggesting the need of early eradication actions.

**Key words:** alien plants, Asteraceae, invasive potential, wildfires.

**Riassunto** - Prima segnalazione della naturalizzazione di *Erechtites hieraciifolius* (L.) Raf. ex DC. per l'Italia.

La specie *Erechtites hieraciifolius* (Asteraceae) viene segnalata per la prima volta in Italia come neofita naturalizzata nel Carso. La specie è stata ritrovata nel 2023 in aree boschive colpite da un vasto incendio nel 2022. Le caratteristiche dei ritrovamenti fanno supporre che si tratti di una specie naturalizzata potenzialmente invasiva. Questa nuova scoperta sottolinea la necessità di ulteriori ricerche per comprendere meglio la sua colonizzazione ed espansione e la necessità di tempestive azioni di eradicazione.

**Parole chiave:** Asteraceae, incendi, piante aliene, potenziale invasivo.

*Erechtites hieraciifolius* (L.) Raf. ex DC. (≡ *Senecio hieraciifolius* L.) (Asteraceae) is a therophyte native to the Americas, introduced as medicinal or ornamental plant or unintentionally to Asia, Europe, and the Pacific region

(Barkley, 2006; Darbyshire *et al.*, 2012; Rojas-Sandoval, 2022). It is rapidly spreading in Europe as a new alien species in many eastern countries (Gudinskas & Taura, 2020; Dudáš *et al.*, 2022; Kaplan *et al.*, 2023; Štech *et al.*, 2023). Reports of its occurrence have emerged from Germany, Austria, Slovenia, Croatia, Bosnia-Herzegovina, Serbia, Czechia, Slovakia, Poland, Romania, and Hungary; it is considered invasive in Czechia, Hungary, and Poland (Greuter, 2006+; Zaniewski *et al.*, 2020; Rojas-Sandoval, 2022; Pladias, 2014+).

In North America it mainly occurs in deciduous and mixed forest areas, but it grows also in rocky open woods, eroded slopes, thickets, waste ground, wetlands, fields and along roadsides and railroads (Steyermark, 1963; Britton & Brown, 1970; Barkley, 2006; Darbyshire *et al.*, 2012). It is a pioneer species associated with major disturbances, such as forest fires (common name: American burnweed, fireweed), but it is also common in disturbed forest edges and in stands affected by wind-throws. The species prefers shade and moist conditions (Neal *et al.*, 2023), but shows a considerable phenotypic variability, since it colonizes areas with different soil nutrient content, moisture, pH and salinity (White *et al.*, 2017).

The first record in Europe dates to 1876 in Croatia (Kornhuber & Heimerl, 1885). The species remained rare until the beginning of the 2000s, when it showed a fast spread, especially along an east to west direction. It becomes a weed with an expansion possibly related to climate change or extension of its ecological amplitude, as well as to an increase in fire frequency (Zaniewski *et al.*, 2020). Most records in Europe are related to forest clearings, but it has been found also in open-canopy forests, man-made habitats, disturbed sites, waste grounds, exposed bottoms of fishponds and flower beds (see e.g. Kaplan *et al.*, 2023).

*Erechtites hieraciifolius* is an annual species, up to 100-200 cm tall with an erect stem, simple or branched above, and alternate, ovate-lanceolate to lanceolate, sessile leaves up to 20 cm or more long, with irregularly coarsely toothed to coarsely lobate-dentate margins (Fig. 1a). Reproduction is by seeds, which are mainly dispersed by wind. The germination is enhanced by soil disturbance, including fire (Neal *et al.* 2023). It has economic impacts

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being a serious weed of crops and mixed pastures. Thanks to its fast growth, large size and abundant production of seeds it can outcompete other species, with negative impacts on native biodiversity and modification of successional processes (Rojas-Sandoval, 2022). We found *E. hieraciifolius* during fieldwork carried out in July-September 2023 in the western Classical Karst (Friuli Venezia Giulia, FVG, North-East Italy) near the border between Italy and Slovenia, in areas affected by large fires in July 2022, within burnt karstic thermophilous mixed *Quercus pubescens* Willd. subsp. *pubescens* woodland and *Pinus nigra* J.F. Arnold subsp. *nigra* plantations. It was found with other neophyte and ruderal species dominant in the burnt areas, e.g. *Erigeron canadensis* L., *E. sumatrensis* Retz., and *Senecio inaequidens* DC.

The plants were identified according to Tutin (1976), Barkley (2006), Haines (2011), and Neal *et al.* (2023).

*Specimina visa* (Fig. 1b): Doberdò del Lago (Gorizia), fraz. Jamiano, burnt area of karstic mixed oak woodland, WGS84: 45.818251N, 13.591968E, 81 m a.s.l., 31 July 2023, F. Boscutti, M. Castello, G. Trotta (TSB); Duino-Aurisina (Trieste), fraz. Medeazza, burnt area of karstic mixed oak woodland, WGS84: 45.801258N, 13.5932914E, 123 m a.s.l., 16 August 2023, G. Trotta, F.

Boscutti (MFU); Doberdò del Lago (Gorizia), fraz. Jamiano, burnt area of karstic mixed oak woodland, WGS84: 45.812900N, 13.572080E, 52 m a.s.l., 22 August 2023, S. Pischedda (Field observation); Doberdò del Lago (Gorizia), loc. Gola Gorica (near Sablici, Gorizia), burnt Black pine plantation, WGS84: 45.807360N, 13.585337E, 90 m a.s.l., 8 September 2023, M. Castello (Field observation).

We observed few individuals in each site (from 3 to 12). Most individuals were adult. Plant height was 80-137 cm; all individuals had abundant flowers and fruits. We propose *E. hieraciifolius* as a naturalized alien species new for the flora of Italy.

The species was found in burnt forest sites, but always in rather or light shaded conditions while it was never found in fully burnt open sites (scrubland or grassland) nor unburnt sites. It seems to prefer moist forest soils. Based on the features of this pioneer species and field observations, we consider *E. hieraciifolius* a plant with a high invasive potential.

In the past, it was recorded in an urban garden in the lowlands of the FVG region in the municipality of Codroipo (Udine), some 60 km away from the present location. (F. Martini personal communication), with an uncertain status of cultivated or escaped plant.

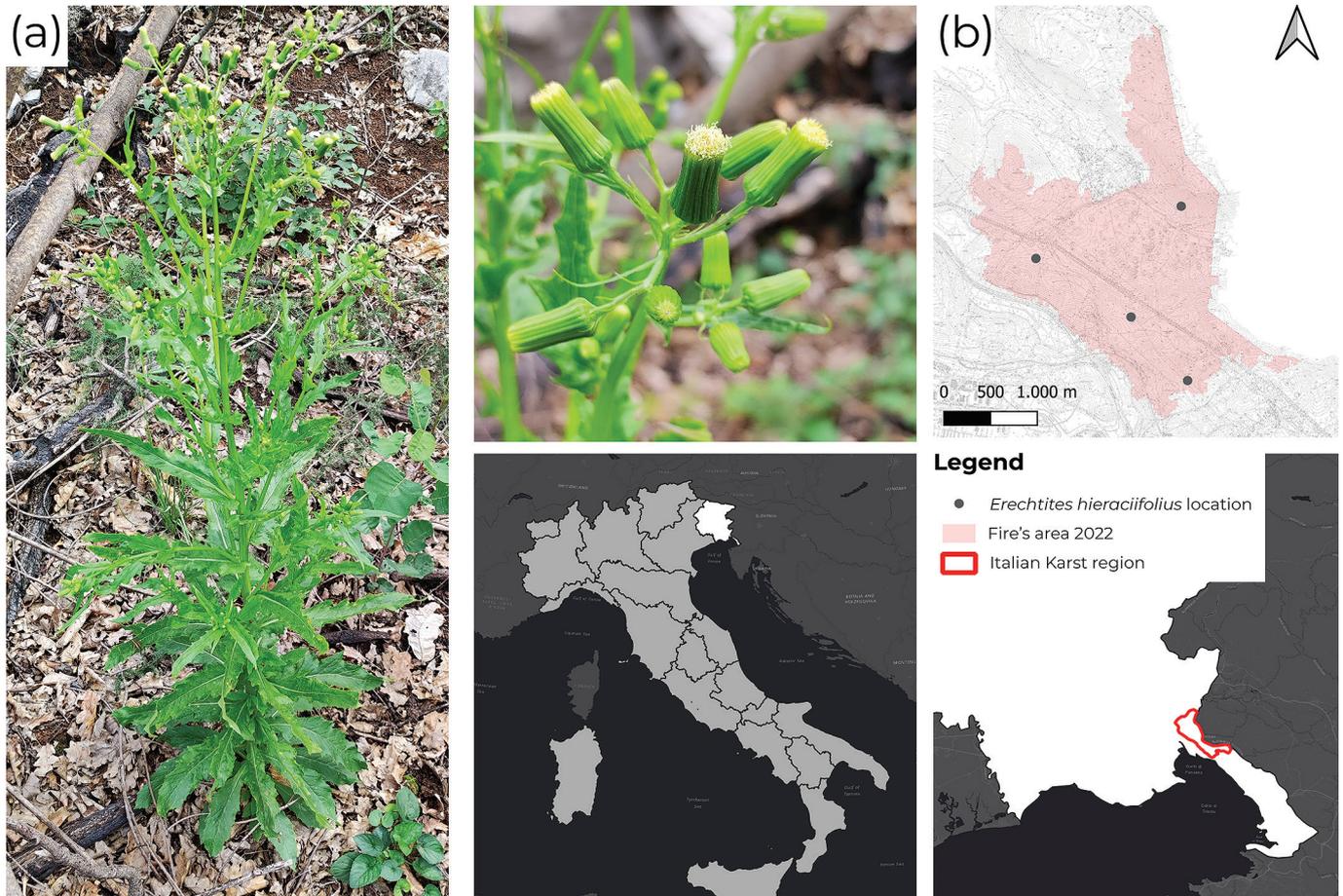


Fig. 1 - Flowering individual and typical flower head of *Erechites hieraciifolius* (L.) Raf. ex DC. recorded in a burnt wood stand in Jamiano (Friuli Venezia Giulia, Italy) (a). The distribution of the population currently known is also reported (b). / Individuo in fiore e capolino tipico di *Erechites hieraciifolius* (L.) Raf. ex DC. trovato in un bosco incendiato a Jamiano (Friuli Venezia Giulia, Italia) (a). Si riporta anche la distribuzione delle popolazioni attualmente note (b). (Photo / Foto: Francesco Boscutti).

After its appearance, connected to the wildfires of 2022 in the Karst, there may occur an ongoing or future dispersion in other burnt areas or other types of disturbed sites, forest clearings and edges. Considering this, our data suggest that further research should be undertaken in the near future to better understand its colonization and expansion mode. We also suggest possible early eradication actions, bearing in mind that manual eradication of this annual weed is particularly easy.

## REFERENCES

- Barkley T. M., 2006 – *Erechtites* Rafinesque. In: Flora of North America North of Mexico. Flora of North America Editorial Committee (eds.). *Oxford University Press*, New York, Oxford, 20: 602-604.
- Britton N. & Brown A., 1970 – An illustrated flora of the northern United States and Canada. *Dover Publications*, New York.
- Darbyshire S. J., Francis A., Di Tommaso A. & Clements D. R., 2012 – The biology of Canadian weeds. 150 *Erechtites hieraciifolius* (L.) Raf. ex DC. *Canadian Journal of Plant Science*, 92 (4): 729-746. <<https://doi.org/10.4141/cjps2012-003>>
- Dudáš M., Király G., Kobiv Y. & Pliszko A., 2022 – New floristic records from Central Europe 9 (reports 122-133). *Thaiszia*, 32 (1): 81-90. <<https://doi.org/10.33542/TJB2022-1-06>>
- Greuter W., 2006+ – Compositae (pro parte majore). In: Compositae. Greuter W. & von Raab-Straube E. (eds.). *Euro+Med Plantbase - the information resource for Euro-Mediterranean plant diversity*. <[https://euoplusmed.org/cdm\\_dataportal/taxon/97e-2ae8c-ad36-40af-9291-e7943f920b3f](https://euoplusmed.org/cdm_dataportal/taxon/97e-2ae8c-ad36-40af-9291-e7943f920b3f)> (Accessed on 08-09-2023)
- Gudžinskas Z. & Taura L., 2020 – New alien plant species recorded in South Lithuania. *Botanica*, 26 (2): 170-183. <<https://doi.org/10.2478/botlit-2020-0018>>
- Haines A., 2011 – New England Wild Flower Society's Flora Novae Angliae: a manual for the identification of native and naturalized higher vascular plants of New England. *Yale University Press*.
- Kaplan Z., Danihelka J., Šumberová K., Prančl J., Velebil J., Dřevojan P., Ducháček M., Businský R., Řepka R., Maděra P., Galušková H., Wild J. & Brůna J., 2023 – Distributions of vascular plants in the Czech Republic. Part 12. *Preslia*, 95 (1): 1-118. <<https://doi.org/10.23855/PRESLIA.2023.001>>
- Kornhuber A. & Heimerl A., 1885 – *Erechtites hieraciifolia* Rafinesque, eine neue Wanderpflanze der europäischen Flora. *Oesterreichische botanische Zeitschrift*, 35: 297-303.
- Neal J. C., Uva R. H., Di Tommaso J. M. & Di Tommaso A., 2023 – Weeds of the Northeast. *Comstock Publishing Associates, an imprint of Cornell University Press*, Ithaca.
- Pladias, 2014+ – Pladias - Database of the Czech Flora and Vegetation. <<http://www.pladias.cz>> (Accessed on 08-09-2023).
- Rojas-Sandoval J., 2022 – *Erechtites hieraciifolius* (American burnweed). CABI Compendium. <<https://doi.org/10.1079/cabicompendium.114182>> (Accessed on 09-09-2023).
- Štech M., Holá E. & Diewald W., 2023 – Novelties in the flora of the Bohemian forest II. *Silva Gabreta*, 28: 49-63.
- Steyermark J. A., 1963 – Flora of Missouri. *Iowa State University Press*, Ames.
- Tutin T. G., 1976 – 95. *Erechtites* Rafin. In: Flora Europaea. Tutin T. G., Heywood V. H., Burges N. A., Moore D. M., Valentine D. H., Walters S. M. & Webb D. A. (eds.). *Cambridge University Press*, Cambridge, 4: 191.
- White S. N., Zhang L. & Pruski K., 2017 – Investigation of potential seed dormancy mechanisms in American burnweed (*Erechtites hieraciifolius*) seeds from wild blueberry (*Vaccinium angustifolium*) fields. *Weed Science*, 65 (2): 256-265. <<https://doi.org/10.1017/wsc.2016.21>>
- Zaniewski P. T., Wołkowycki D., Szczepkowski A., Otręba A., Zaniewska E. & Kębłowska A., 2020 – Patterns of invasion, biology and ecology of *Erechtites hieraciifolia* in the northern expansion range in Europe (C and NE Poland). *Baltic Forestry*, 26 (1): 409. <<https://doi.org/10.46490/BF409>>