



short communication / kratko priopćenje

## ANREDERA CORDIFOLIA (TEN.) STEENIS (BASELLACEAE), NATURALISED IN SOUTH CROATIA

ZVJEZDANA STANČIĆ<sup>1</sup> & DARKO MIHELJ<sup>2</sup>

<sup>1</sup>Ul. Stjepana Radića 28, HR-49 221 Bedekovčina, Croatia  
(e-mail: [zvjezdana.stancic@kr.t-com.hr](mailto:zvjezdana.stancic@kr.t-com.hr))

<sup>2</sup>Department of Botany and Botanical garden, Faculty of Science,  
University of Zagreb, Marulićev trg 9a, HR-10000 Zagreb, Croatia  
(e-mail: [darko@botanic.hr](mailto:darko@botanic.hr))

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The species *Anredera cordifolia* was recorded in the beginning of 20<sup>th</sup> century as an ornamental plant in gardens and parks in south Croatia. In this paper, it is noted as being naturalised along the roadside in the composition of ruderal vegetation near Bačina. The species was established for the first time in 2006, and again at the same locality during the following two years. So far, the species can be characterised as having escaped from culture and become naturalised, but not invasive, the case with this species in other warm parts of the world.

**Key words:** neophytes, *Basellaceae*, Bačina, Croatia.

Stančić, Z. & Mihelj, D.: *Anredera cordifolia* (Ten.) Steenis (Basellaceae), naturalizirana vrsta u južnoj Hrvatskoj. *Nat. Croat.*, Vol. 19, No. 1, 273–279, 2010, Zagreb.

Vrsta *Anredera cordifolia* zabilježena je već početkom 20. stoljeća kao ukrasna biljka vrtova i parkova južne Hrvatske. U ovome je radu zabilježena kao samonikla uz cestu u sastavu ruderalne vegetacije kod mjesta Bačina. Vrsta je prvi puta utvrđena 2006. godine, a potom je na istom lokalitetu opažena i sljedeće dvije godine. Zasad se vrsta može okarakterizirati kao pobjegla iz kulture i naturalizirana, ali ne kao invazivna, što je slučaj s ovom vrstom u drugim toplim krajevima svijeta.

**Ključne riječi:** neofiti, *Basellaceae*, Bačina, Hrvatska.

### INTRODUCTION

The species *Anredera cordifolia* (Ten.) Steenis is also known under the following synonyms: *Boussingaultia cordifolia* Ten., *B. baselloides* auct., non Humb., Bonpl. & Kunth (WALTERS, 1993), *B. gracilis* Miers, *B. g. f. pseudobaselloides* Haum. (WAGNER *et al.*, 1999).

The common English name is Madeira vine. Less used names are: mignonette vine, lamb's tail, anredera (BAILEY, 1942; HEYWOOD, 1993; WAGNER *et al.*, 1999; Pacific Island Ecosystems at Risk, 1999).

According to WAGNER *et al.* (1999) the genus *Anredera* comprises 5–10 species from tropical America. The species *Anredera cordifolia* belongs to the *Basellaceae* family (WALTERS, 1993).

*Anredera cordifolia* is a perennial climber (vine) with 3-7 m long branched stems with aerial tubers; leaves are fleshy, heart-shaped, from this comes the name *cordifolia*; alternately arranged on slender stems, the many white flowers are collected in long axillary spikes (Fig. 1); the stem grows from fleshy underground rhizomes (BAILEY, 1942; ENCKE, 1958).

Its native distribution is in South America, from Paraguay to southern Brazil and northern Argentina (WAGNER *et al.*, 1999). The species has been introduced in many warm parts of the world where it has become invasive, as in: southern Africa (WILDY, 2006), Australia (Weeds Australia, 2008), Europe (WALTERS, 1993), Hawai'i (STARR *et al.*, 2003), southern North America (HEYWOOD, 1993), the Pacific islands (Pacific Island Ecosystems at Risk, 1999), New Zealand (ROY *et al.*, 2004).



Fig. 1. Inflorescence of *Anredera cordifolia* (Ten.) Steenis.



Fig. 2. Distribution map of *Anredera cordifolia* (Ten.) Steenis in Croatia.

In Croatia, the species was recorded as a decorative plant from gardens and parks in the Mediterranean region (HAYEK, 1927; ADAMOVIĆ, 1929). ADAMOVIĆ (1929) wrote »*Boussingaultia baselloides* ist ebenfalls Schlingpflanze, die die Lauben und Mauern im Herbst mit wohlreichenden weißen blütennahen deckt. Da sie eine Knolle besitzt und erst im Frühjahr treibt, kann sie auch in nördlichen gelegenen Ländern wohl gedaihen«. The author did not mention the localities where the species was observed.

Through a search of the most important Croatian floristic works (VISIANI, 1842, 1847, 1852, 1872; SCHLOSSER & FARKAŠ-VUKOTINOVIĆ, 1869; DEGEN, 1936, 1937, 1938; DOMAC, 1994; HIRC, 1903–1912; NIKOLIĆ, 1994, 1996, 1997, 2000a, 2000b, 2009; FORENBACHER, 2001; HRŠAK, 2001; BOGDANOVIĆ & NIKOLIĆ, 2004) it was established that the species *Anredera cordifolia* was registered neither as a cultivated nor as a wild species.

WALTERS (1993) in *Flora Europaea* cites the species for the area of former Yugoslavia under the name *Boussingaultia cordifolia* with the general note »cultivated for

ornament and as a vegetable, and naturalized on roadsides and in waste places in S. Europe«.

In this paper, *Anredera cordifolia* is noted as a naturalised plant species in south Croatia.

## RESULTS AND DISCUSSION

The species *Anredera cordifolia* (Ten.) Steenis was recorded at Baćina, in south Croatia (Fig. 2), at a site with the following Gauß-Krüger coordinates: 5697769, 4772266, on the surface of around six square metres. The locality is near the turning off from the main road (Adriatic highway) to the Baćina Lakes. The plant is growing in a ruderal habitat, between two roads, on young bushes of the species *Vitex agnus-castus* (Fig. 3). It was established for the first time on September 26, 2006. A year later, on October 8, the species was found in equal abundance at the same locality and again on October 26, 2008.

The stability of the *Anredera cordifolia* population at this locality implies that the species is able to grow and survive in the habitat without human intervention. Considering the long time the species has been present in south Croatia since perhaps much before the literature note (HAYEK, 1927; ADAMOVIĆ, 1929), it is not very widespread and it seems not to represent a threat to the wild flora and vegetation. *Anredera cordifolia* in this case can be characterised as having escaped from culture, and naturalised, but so far without the capacity of invasive spreading that it has in some other regions of the world.



Fig. 3. *Anredera cordifolia* (Ten.) Steenis in the habitat near Baćina.

There are several characteristics that contribute to the invasive spreading of *Anredera cordifolia* in the conditions of a warm and moist climate (STARR *et al.*, 2003): aggressive vegetative growth, difficulty of control and eradication once established, the ability to smother other plants, ability of aerial tubers to survive in the canopy five years after the branches they belonged to were cut and to generate new plants. The tubers can spread by being washed downstream and possibly along sea coasts (HALEY, 1997). Growth rates of stems can exceed 1 m per week and up to 6 m in a growing season (NEAL, 1965). Dispersal is also possible by division of rhizomes (WALTERS, 1989; ENCKE, 1958) and by green waste from gardens (STARR *et al.*, 2003). As a climber it can cause breaking of branches and the entire trees due to its weight. The final negative effect is the displacement of the native flora and vegetation.

Due the possibility of becoming invasive, the range of the distribution of *Anredera cordifolia* in Croatia should be monitored.

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## REFERENCES

- ADAMOVIĆ, L., 1929: Die Pflanzenwelt der Adrialänder. Verlag von Gustav Fischer, Jena, p. 133.
- BAILEY, L. H., 1942: The standard cyclopedia of horticulture. Vol. 1 A-E. The Macmillan company, New York, p. 535–536.
- BOGDANOVIĆ, S. & T. NIKOLIĆ, 2004: Notulae ad Indicem Florae Croatiae, 4. Nat. Croat., **13**, 407–420.
- DEGEN, A., 1936: Flora Velebitica. I. Band. Verlag der Ungar. Akademie der Wissenschaften, Budapest.
- DEGEN, A., 1937: Flora Velebitica. II. Band. Verlag der Ungar. Akademie der Wissenschaften, Budapest.
- DEGEN, A., 1938: Flora Velebitica. III. Band. Verlag der Ungar. Akademie der Wissenschaften, Budapest.
- DOMAC, R., 1994: Mala flora Hrvatske. Školska knjiga, Zagreb.
- ENCKE, F. (ed.), 1958: Blumengärtnerei. 1. Band. 2. Aufl. Paul Parey, Berlin-Hamburg, p. 586.
- FORENBACHER, S., 2001: Velebit i njegov biljni svijet. Školska knjiga, Zagreb.
- HALEY, N., 1997: Weed Control Methods: *Anredera cordifolia*. New Zealand Department of Conservation, Environmental BOP (Bay of Plenty Regional Council). Available: <http://www.boprc.govt.nz/www/green/weedindex.htm> (Accessed: July 25, 2001).
- HAYEK, A., 1927: Prodromus Florae peninsulae Balcanicae. Vol. 1. Verlag des Repertoriums, Dahlem bei Berlin, p. 166–167.
- HEYWOOD, V. H., 1993: Flowering plants of the world. Oxford University Press, Oxford-London-Melbourne, p. 75–76.
- HIRC, D., 1903–1912: Revizija hrvatske flore. JAZU, Zagreb.
- HRŠAK, V., 2001: Notulae ad Indicem Florae Croatiae, 3. Nat. Croat., **10**, 67–72.
- NEAL, M. C., 1965: In Gardens of Hawai'i. Bernice P. Bishop Museum Special Publication 40. Bishop Museum Press, Honolulu.

- NIKOLIĆ, T. (ed.), 1994: Flora Croatica. Index Florae Croaticae. Pars 1. Nat. Croat., **3** (Suppl. 2), 1–116.
- NIKOLIĆ, T. (ed.), 1996: Notulae ad Indicem Florae Croaticae, 1. Nat. Croat., **5**, 95–97.
- NIKOLIĆ, T. (ed.), 1997: Flora Croatica. Index Florae Croaticae. Pars 2. Nat. Croat., **6** (Suppl. 1), 1–232.
- NIKOLIĆ, T. (ed.), 2000a: Flora Croatica. Index Florae Croaticae. Pars 3. Nat. Croat., **9** (Suppl. 1), 1–324.
- NIKOLIĆ, T. (ed.), 2000b: Notulae ad Indicem Florae Croaticae, 2. Nat. Croat., **9**, 217–221.
- NIKOLIĆ, T., 2009: Flora Croatica Database On-Line. Department of Botany, Faculty of Science, University of Zagreb. Available: <http://hirc.botanic.hr/fcd> (Accessed: March 23, 2009).
- Pacific Island Ecosystems at Risk (PIER), 1999: *Anredera cordifolia*. US Forest Service, Institute of Pacific Islands Forestry, Available: [http://www.hear.org/pier/species/anredera\\_cordifolia.htm](http://www.hear.org/pier/species/anredera_cordifolia.htm) (Accessed: March 22, 2009).
- ROY, B., I. POPAY, P. CHAMPION, T. JAMES & A. RAHMAN, 2004: An Illustrated Guide to Common Weeds of New Zealand. 2nd ed., New Zealand Plant Protection Society, Havelock North.
- SCHLOSSER, J. & L. FARKAŠ-VUKOTINOVIĆ, 1869: Flora Croatica. Zagrebiae.
- STARR, F., K. STARR & L. LOOPE, 2003: *Anredera cordifolia*. United States Geological Survey Biological Resources Division: Haleakala Field Station, Maui, Hawai'i, p. 1–6.
- VISIANI, R., 1842: Flora Dalmatica. Vol. 1. Apud Friedericum Hofmeister, Lipsiae.
- VISIANI, R., 1847: Flora Dalmatica. Vol. 2. Apud Friedericum Hofmeister, Lipsiae.
- VISIANI, R., 1852: Flora Dalmatica. Vol. 3. Apud Friedericum Hofmeister, Lipsiae.
- VISIANI, R., 1872: Florae Dalmaticae Supplementum. Typis Josephi Antonelli, Venetiis.
- WAGNER, W. L., D. R. HERBST & S. H. SOHMER, 1999: Manual of the Flowering Plants of Hawai'i. 2 vols. Bishop Museum Special Production 83. University of Hawaii Press and Bishop Museum Press, Honolulu, p. 381.
- WALTERS, S. M. (ed.), 1989: The European Garden Flora. Vol. III, Dicotyledons (Part I), Cambridge University Press, Cambridge, p. 176.
- WALTERS, S. M., 1993: *Boussingaultia* Humb., Bonpl. & Kunth. In: TUTIN, T. G., N. A. BURGESS, A. O. CHATER, J. R. EDMONDSON, V. H. HEYWOOD, D. M. MOORE, D. H. VALENTINE, S. M. WALTERS & D. A. WEBB (eds.): Flora Europaea. Vol. 1. 2nd ed., Cambridge University Press, Cambridge, p. 139.
- Weeds Australia, 2008: Madeira Vine – *Anredera cordifolia*, Noxious Weed List for Australian States and Territories, National Weeds Strategy, Australian Weeds Committee. Available: <http://www.weeds.org.au> (Accessed: March 22, 2009).
- WILDY, E., 2006: Alien Invader Plants within South Africa. Wildlife and Environment Society of South Africa (WESSA), Kwa Zulu Natal Region. Available: <http://www.geocities.com/wessaaliens/index.htm> (Accessed: March 22, 2009).

## S A Ž E T A K

***Anredera cordifolia* (Ten.) Steenis (Basellaceae), naturalizirana vrsta u južnoj Hrvatskoj**

Z. Stančić &amp; D. Mihelj

Vrsta *Anredera cordifolia* (Ten.) Steenis je već otprije poznata kao ukrasna vrsta sađena po vrtovima i parkovima južnog dijela mediteranske Hrvatske (HAYEK, 1927; ADAMOVIĆ, 1929). U rujnu 2006. godine vrsta je utvrđena kao samonikla u sastavu ruderalne vegetacije uz cestu kod mjesta Baćina. Nakon prvog pronalaska vrsta je na istom lokalitetu praćena slijedeće dvije godine te je utvrđeno da se uspješno održava na staništu. S velikom vjerojatnošću se može pretpostaviti da vrsta raste i na drugim lokalitetima južnog dijela Hrvatske kao samonikla. Budući da je vrsta prema literaturnim zapisima na području južne Hrvatske prisutna već od prve polovice 20. stoljeća, a tek je ovim radom utvrđena kao odbjegla iz kulture, može se zaključiti da se ne radi o invazivnoj biljci na ovome prostoru. No, kao i sve druge strane vrste trebalo bi pomno pratiti njeno daljnje širenje.