Belg. Journ. Bot. **137** (1) : 85-90 (2004)

Short note

LURONIUM NATANS, A RARE SPECIES IN THE IBERIAN PENINSULA

Maria I. ROMERO*, Marco RUBINOS and Pablo RAMIL
Departament of Botany, Escola Politécnica Superior,
University of Santiago, Campus of Lugo, 15702 Lugo, Spain
(*Author for correspondence ; e-mail : bvrosma@usc.es)

Received 3 October 2003 ; accepted 25 November 2003.

ABSTRACT. — The morphological similarity between *Luronium natans* and *Baldellia alpestris*, and their co-occurrence at some sites, has led to a degree of confusion in the literature about the current status of *L. natans* in the Iberian Peninsula. Recent publications have suggested that there are only 4 small populations of this species in the Iberian Peninsula. Here we report an additional 11 small populations, in NW Spain. We also discuss its morphology and differentiation from *B. alpestris*, and aspects of its biology and ecology.

KEY WORDS. — Alismataceae, rarity, threat, distribution, aquatic plant, Iberian flora.

INTRODUCTION

Luronium natans (L.) Rafin. (Alismataceae) is included within the Atlantic species phytogeographical group (ARTS & DEN HARTOG 1990). It is a palaeoendemic (COOK 1983). It occurs in freshwater (RODRÍGUEZ-OUBIÑA *et al.* 1997), and like other freshwater species it is currently rare and threatened (Anon. 1982), as recognized in Annex I of the Berne Convention (1979) and in the Habitats Directive 92/43/EC (Annex II).

In the Iberian Peninsula, where it has recently been catalogued as an endangered species (AIZPURU *et al.* 2000), it is likewise a rare plant, with a highly dispersed distribution mainly in high-altitude wetlands (> 1300 m a.s.l.), although it has been reported from NW Spain at much lower altitude (RODRÍGUEZ-OUBIÑA & ORTIZ 1991). More recently, it has been reported to be extinct in NW Spain (ORTIZ *et al.* 1997).

If we additionally bear in mind the frequent confusion of this plant with the Iberian endemic *Baldellia alpestris* (Cosson) Laínz (LAÍNZ 1967, AMICH & ELIAS 1985, RODRÍGUEZ-OUBIÑA & ORTIZ 1991, GUILLÉN *et al.* 1998), it seems likely that its already fragmented distribution has become even more fragmented and reduced during the last decades.

Here, we report on 11 new populations of *Luronium natans* from NW Spain. We also report briefly on its morphology and differentiation from *B. alpestris*, as well as some aspects of its biology and ecology.

MATERIAL AND METHODS

We first reviewed all published information on the presence of this taxon in Iberia, and consulted documentation in all herbaria with Iberian material (BCN, JACA, LOU, LUGO, MA, MAF, SANT), where possible with direct examination.

During the period 2000 - 2002, we visited all sites in the Iberian Peninsula from which this species has been reported, as well as a number of other sites at which it might potentially occur. When the species was detected, we recorded geographical location, habitat, and phenological data.

RESULTS

Taxonomic identification

Our herbarium studies indicate that *Luronium natans* and *Baldellia alpestris* continue to be confused in the Iberian Peninsula. Some characters can be added to those already known to differentiate the two taxa (Heywood 1980), especially before fruit formation. Specifically, in *B. alpestris* the pointed tip of the fruit is longer and curved, while the achenes (> 16) are arranged in a globose head. By contrast, in *L. natans* the fruits (< 12) have a wider and more club-shaped tip, located at the same height in the receptaculum (see Fig. 1). Also useful is the strong, coriander-like smell produced by *B. alpestris* on collection, as noted by Rodríguez-Oubiña & Ortiz (1991).

Distribution

The first Iberian records of this taxon were from Galicia and La Rioja (Willkomm 1861). Subsequently Font Quer (1924) reported it from the Sierra de Neila (Burgos). There were subsequently other reports, though the first report which can be confirmed on the basis of existing herbarium material is that of Perdigó (1983) from the Central Pyrenees. Its presence in Galicia was confirmed more recently (see Rodríguez-Oubiña & Ortiz 1991), and in the last decade it has also been reported from Avila, Burgos and Soria where, as in Galicia, it may co-occur with *Baldellia alpestris*. In Galicia, despite the earlier 1991 report, *L. natans* was recently classed as extinct (Ortiz *et al.* 1997), but we have recently found it at 11 sites in the Terra Chá area of Lugo Province, northwest of Iberian Peninsula (Table 1 and Fig. 2). Only one of these sites has been previously reported.

Ecology

In the Iberian Peninsula, *L. natans* has been recorded from altitudes between 400 m (Terra Chá) and 1900 m (Sierra de Neila). However, most populations are located at altitudes between 386 and 440 m (Table 1).

It occurs in shallow pools, channels, or lake margins, and also in slow-flowing parts of rivers and streams. The densest populations are found in lentic habitats, although we have found that some populations show temporal instability, and indeed may disappear from one year to the next. Flowering at low-altitude sites appears to be related to water depth : it tends to be earlier in water bodies that dry up in the summer, and later in permanent water bodies.

CONCLUSIONS

The apparently contradictory information in the literature on *L. natans* is probably due not only to its morphological similarity with *B. alpestris*, but also to the fact that at some sites these species co-occur.

Currently, a total of 15 small populations of *L. natans* are known in the Iberian Peninsula, of which 11 are newly reported here. Most of the populations (about 75% of all Iberian populations) are located in northwest Spain at around 400 m a.s.l, in both lentic and slow-flowing lotic habitats.

The highly fragmented distribution of *L. natans* in the Iberian Peninsula has meant that it has been considered as rare. This fragmentation does not appear to be attributable simply to scarcity of appropriate habitat, since as in other countries (Willby & Eaton 1993, Greulich *et al.* 2000) it appears in rather diverse freshwater habitats.

We do not know whether its rarity is attributable to an inefficient reproductive strategy (see Sculthorpe 1967, Kay *et al.* 1999). Certainly, we have observed sexual reproduction at almost all of the 15 sites reported here, with fruit production apparently similar to that observed by other authors in other European countries (see Charlton 1999, Kay *et al.* 1999).

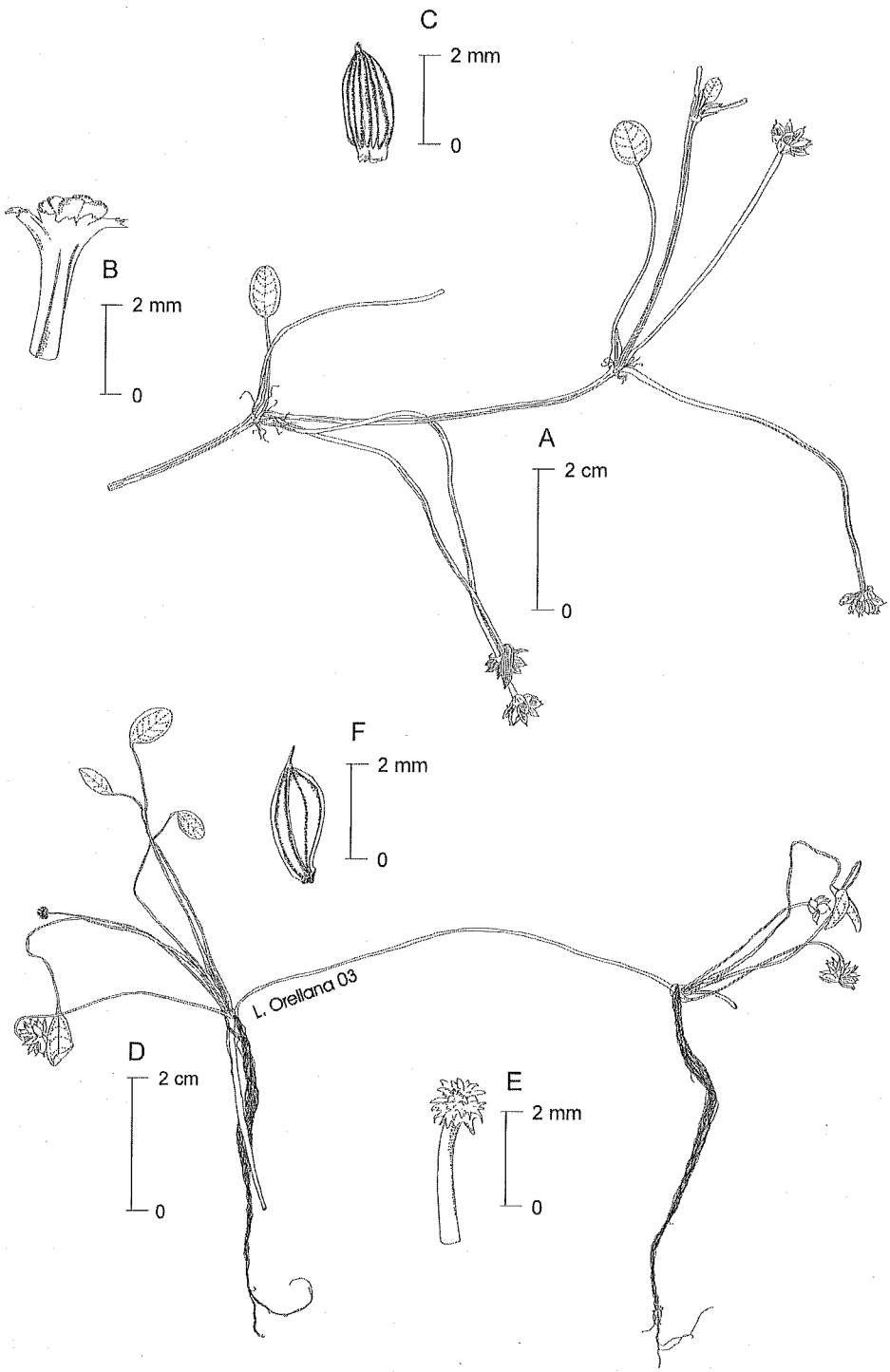

FIG. 1. — *Luronium natans* : A, habit (SANT 17719/1) ; B, receptaculum ; C, detail of fruit. *Baldellia alpestris* : D, habit (SANT 29464) ; E, detail of receptaculum ; F, achene.

TABLE 1

Known locations of Luronium natans *in the Iberian Peninsula showing habitat (lo = lotic, le = lentic) and summarised phenological data (V = May, etc.). For more details on the abbreviations of the herbarium references see* HOLMGREN *et al. (1990)*

Province	Altitude	Habitat		Phenology					Source	Herbarium ref.
UTM		Lo	Le	Flower / Fruit						
Lugo				V	VI	VII	VIII	IX		
29TPH1272	388	x					+/+			LUGO 762 ; SANT 46306
29TPH1375	386	x					+/+			LUGO 757,760 ; SANT 46305
29TPH1581	400	x								
29TPH1787	400		x		+/+				RODRÍGUEZ-OUBIÑA & ORTIZ 1991	SANT 17719, 46307
29TPH1788	400		x	+/o	+/+					
29TPH1789	400	x								LUGO 753
29TPH1880	407	x					+/+			LUGO 761 ; SANT 46308
29TPH1882	420	x					+/o	o/+		LUGO 754, 755
29TPH1983	408	x					+/+			LUGO 756
29TPH2083	410	x				+/o	o/+			
29TPH2989	440	x				+/+	o/+			LUGO 758, 759 ; SANT 46309
Avila										
30TVL9501	1350	x					+/+		GARCÍA ADÁ *et al.* 1996	LOU 23441 ; MA 566052
Burgos										
30TVM9554	1890		x			+/+	+/+		MOLINA ABRIL 1999	MAF 154347, 155206, 156917, 157112
Soria										
30TWM1148	1640		x				+/+		AEDO *et al.* 2000	Herb. Sánchez Pedraja 08242, 08243bis, 08378
Lleida										
31TCH23	1600		x			+/+	+/+	o/+	PERDIGÓ 1983	BCN 733,734,735 ; JACA 232382

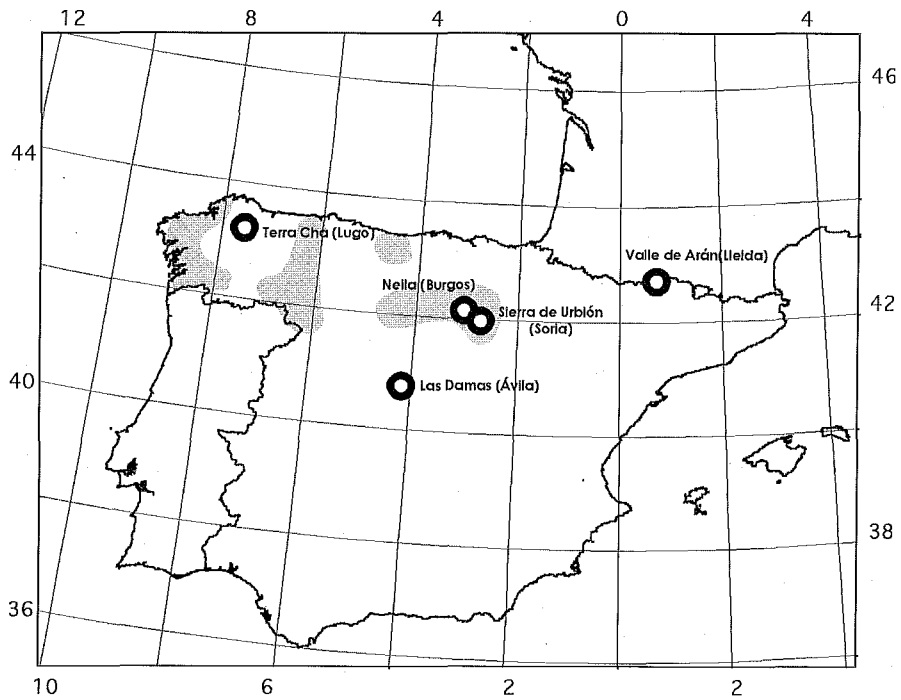

FIG. 2. — Known locations of *Luronium natans* in the Iberian Peninsula (black circles). The shaded area shows the wider distribution of *Baldellia alpestris*, as deduced from previous publications and herbarium material.

ACKNOWLEDGEMENTS

We are especially indebted to Oscar Sanchez Pedraja and the keepers of the herbaria mentioned. The illustrations were kindly prepared by Luis Gómez-Orellana. The work was partly financed by the PGID-TO1MAM29101PR from The Galician Government.

REFERENCES

AEDO C., ALDASORO J. J., ARGÜELLES J. M., CARLÓN L. C., DÍEZ RIOL A., GONZÁLEZ DEL VALLE J. M., LAÍNZ M., MORENO MORAL G., PATALLO J. & SÁNCHEZ PEDRAJA O., 2000. — Contribuciones al conocimiento de la flora cantábrica, IV. *Bol. Cien. Nat. R.I.D.E.A* **46** : 7-119.

AIZPURU *et al.*, 2000. — Lista Roja de Flora Vascular Española (valoración según categorías UICN). *Conservación Vegetal* **6** (extra) : 11-38.

AMICH F. & ELÍAS M. J., 1985. — Aportaciones al conocimiento de la flora del Sistema Ibérico, I : plantas de Sierra Cebollera. *Anales Jard. Bot. Madrid* **41** : 381-393.

ANONYMOUS, 1979. — Convention on the Conservation of European Wildlife and Natural Habitats. Council of Europe, Berne.

ANONYMOUS, 1982. — List of Rare, threatened and endemic plants in Europe. Threatened Plants Unit (IUCN Conservation Monitoring Centre), Kew, UK. Council of Europe, Strasbourg.

ANONYMOUS, 1992. — Directiva 92/43/CEE del Consejo, relativa a la conservación de los hábitats naturales y de la fauna y flora silvestres. Diario Oficial de Las Comunidades Europeas.

ARTS G. H. P. & DEN HARTOG C., 1990. — Phytogeographical aspects of the west European soft-water macrophyte flora. *Acta Bot. Neerl.* **39** (4) : 369-378.

CHARLTON W. A., 1999. — Studies in the *Alismataceae*. X. Floral organogenesis in *Luronium natans* (L.) Raf. *Can. J. Bot.* **77** : 1560-1568.

COOK C. D. K., 1983. — Aquatic plants endemic to Europe and the Mediterranean. *Bot. Jahrb. Syst.* **103** : 539-582.

FON QUER P., 1924. — Datos para el conocimiento de la flora de Burgos. *Treb. Inst. Catalana. Hist. Nat.* **5** : 1-56.

GARCÍA ADÁ R, LÓPEZ G. & VARGAS P., 1996. — Notas botánicas sobre la flora vascular del centro de la Península Ibérica. *Candollea* **51** : 373-380.

GREULICH S., BORNETTE G., AMOROS C. & ROELOFS J. G. M., 2000. — Investigation on the fundamental niche of a rare species : an experiment on establishment of *Luronium natans*. *Aquatic Bot.* **66** : 209-224.

GUILLÉN A., LAÍNZ M, LASTRA J. & MAYOR M., 1998. — Algo acerca de *Baldellia alpestris* (Coss.) M. Laínz (*Alismataceae*) : número cromosomático, puntualizaciones a la descripción original y un par de citas notables de Asturias. *Anales Jard. Bot. Madrid* **56** : 392-393.

HEYWOOD V. H., 1980. — Alismataceae. In : TUTIN V. H. *et al.* (eds.), *Flora europaea*, vol. V, pp. I. Cambridge University Press, Cambridge.

HOLMGREN P. K., HOLMGREN N. H. & BARNETT L. C. (eds.) 1990. — *Index Herbariorum. Part I : The herbaria of the world*, 8th ed. International Association for Plant Taxonomy, New York Botanical Garden, New York.

KAY Q. O. N., JOHN R. F. & JONES R. A., 1999. — Biology, genetic variation and conservation of *Luronium natans* (L.) Raf. in Britain and Ireland. *Watsonia* **22** (4) : 301-315.

LAÍNZ M., 1967. — Aportaciones al conocimiento de la flora gallega, V. *Anales Inst. forest. Invest.* **12** : 1-51.

MOLINA ABRIL J. A., 1999. — De hydrophytis hispaniae centrales notulae praecipue chorologicae, III. *Fl. Montiberica* **11** : 4-5.

ORTIZ S., RODRÍGUEZ-OUBIÑA J. & IGLESIAS I., 1997. — Situación actual del conocimiento y nivel de protección de la flora rara y amenazada de Galicia. *Conservación Vegetal* **2** : 2-3.

PERDIGÓ M. T., 1983. — L'estanyo, un petit estany interessant a la Vall D'Aran. *Collect. Bot. (Barcelona)* **14** : 511-514.

RODRÍGUEZ-OUBIÑA J. & ORTIZ S., 1991. — *Luronium natans* (Alismataceae) in the Iberian Peninsula. *Willdenowia* **21** : 77-80.

RODRÍGUEZ-OUBIÑA J., ROMERO M. I. & ORTIZ S., 1997. — Communities of the class *Littorelletea uniflorae* in the northwest Iberian Peninsula. *Acta Bot. Gallica* **144** : 155-169.

SCULTHORPE C. D., 1967. — *The biology of aquatic vascular plants*. Koeltz Scientific Books, Königstein, Germany.

WILLBY N. J. & EATON J. W., 1993. — The distribution, ecology and conservation of *Luronium natans* (L.) Raf. in Britain. *J. Aquat. Plant Manage.* **31** : 70-76.

WILLKOM M., 1861. — *Alismeae* Endl. Ench. In : WILLKOM M. & LANGE J. (eds.), *Prodromus florae hispanicae*, vol. I, pp. 158-159. Stuttgart.