

R*hamphidium purpuratum* Mitt. (Fig. 1) was first described from the Azores and later from the island of Madeira (Geheeb & Herzog, 1910). The species is now known to be widely distributed in Macaronesia, Madeira (Sérgio *et al.*, 2006), all islands of the Azores, excluding Graciosa and Santa Maria (Gabriel *et al.*, 2005), and in the Canary Islands where it has been reported on Tenerife and Gomera (Losada-Lima *et al.*, 2004; Patiño *et al.*, 2006). It has also been found on the Mediterranean island of Crete (Gradstein, 1971; Blockeel, 2007; Lüth & Frahm, 2008), but the occurrence of the species here is endangered by development of the road network (Lüth & Frahm, 2008).

However, on the European mainland, the only sites reported to date have been in Portugal. The original reference was given by Luisier (1947, 1948), based on collections from the north of the country, in the Minho Region in the locality of Caldelas (Fig. 2). The first collection was made in 1940, and the species was refound in 1947 at the same locality and at a

second site in the same valley. All this Portuguese material is deposited in the INA, LISU and LISE herbaria. Due to its restricted occurrence, *R. purpuratum* is considered as VU (Vulnerable) in the European Red List (www.bio.ntnu.no/ECCB/RDBTaxon.php), but the species was later considered extinct in Portugal by Sérgio *et al.* (1994, 2001).

The genus *Rhamphidium* comprises a small number of species, about 15 according to Arts (1989), most of them distributed in the tropical and temperate regions of the southern hemisphere: South America, India, Java and Papua New Guinea (Noris & Koponen, 1989). O'Shea (1995) did not indicate the presence of this genus in Africa. According to Noris & Koponen (1989), the most recent species of this genus to be described, *Rhamphidium novoguineensis* (from New Guinea), is related and very similar to *R. purpuratum*.

The disjunct distribution of *R. purpuratum* between the Iberian Peninsula and Macaronesia

▽ Fig. 1. A small population of *R. purpuratum* from the Algarve, Portugal. C. García



Rediscovery of *Rhamphidium purpuratum* Mitt. (Bryophyta, Ditrichaceae) in Portugal after more than 60 years

During a field study to characterize the flora of river basins in Portugal, **Cecília Sérgio** and colleagues discovered a small population of a moss that resembled the rare *Rhamphidium purpuratum*. Comparison with herbarium material from Macaronesia confirmed that the Portuguese sample was indeed *R. purpuratum*, despite the absence of sporophytes.

has been well documented since it was first noted by Allorge (1947). It may have been introduced into Portugal by human activity or, alternatively, it is possible that it arrived naturally in relatively recent geological time when some regions in Portugal and the Macaronesia became similar in terms of their climate. The species could represent an ancient disjunction, and for some authors it could be a Tertiary relict (Lüth & Frahm, 2008).

Portugal is also home to other important bryophyte taxa that can be considered Iberian/Macaronesian endemics. This group of bryophytes includes species with Iberian/Macaronesian disjunct distributions which are important in clarifying the origin of the Macaronesian flora (Sérgio, 1990; Sérgio & Draper, 2001). In addition to *R. purpuratum*, examples include

Porella canariensis, *Bryum platyloma* (now included in *B. capillare*), *Isothecium algarvicum*, *Brachythecium dieckii*, *Thamnobryum maderense* and *Frullania azorica*.

The most recent population of *R. purpuratum* was found in south-west Portugal near the Monchique mountains. It was found in the margins of a flowing river, Ribeira da Cerca, within the Ribeira de Aljezur hydrographic basin in the Algarve Region. This small tributary flows through a deep 'vee' valley developed over siliceous geology. The channel substrate at the site is medium-sized to coarse, with 40% cobbles and pebbles, whereas on the banks the dominant substrate is alluvial soil. The site is located at 220 m altitude and displays a drainage area of 14 km². The average annual temperature in the area



△ Fig. 2. ★, Location of the newly discovered population of *R. purpuratum* in Portugal; ●, location described by Luisier (1947, 1948).

is 15.64 °C and the annual precipitation is 951 mm.

The Algarve *R. purpuratum* population grows under the canopy of a riparian alder forest, dominated by *Alnus glutinosa* with the endemic relict shrub *Rhododendron ponticum* subsp. *baeticum* (Fig. 3). The herbaceous layer contains up to 62 species, including *Scrophularia scorodonia*, *Campanula alata*, *Brachypodium sylvaticum*, *Lotus pedunculatus*, *Solanum dulcamara*, *Bromus diandrus*, *Agrostis stolonifera* and *Oenanthe crocata*. Overall, the area is dominated by a tree cover that provides a range of moist microhabitats, including more

or less mesic (moderately moist) patches on the slopes. Other bryophyte species found in this habitat include *Bryum donianum*, *Fissidens crispus*, *Fissidens taxifolius*, *Fossombronia angulosa*, *Kindbergia praelonga*, *Lunularia cruciata* and *Phaeoceros laevis*.

By studying environmental variables in the known areas of distribution in Portugal, and by looking at distribution patterns of this species in the Azores, Madeira, the Canary Islands, Crete and mainland Portugal, it should be possible to estimate potential new sites of occurrence on the Iberian Peninsula for this species, and to look at



△ Fig. 3. The riparian alder forest where the new population of *R. purpuratum* was found. P. Rodríguez-González

how annual mean temperature and temperature seasonality among other factors influence the occurrence of this species.

Specimens studied

Minho: Caldelas, 29TNG5213, 29.09. 1946, A. Luisier (INA, LISU208224); ibidem, 04.10. 1947, A. Luisier (INA, LISU148799; Algarve: Marmelete, 29SNB2830, 14.05. 2009, P. Rodríguez-González, A. Albuquerque (LISU235407).

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Cecília Sérgio¹, Patricia María Rodríguez-González², António Albuquerque² & César Garcia¹

¹Universidade de Lisboa, Museu Nacional de História Natural, Jardim Botânico/Centro de Biologia Ambiental da Faculdade de Ciências da Universidade de Lisboa, Rua da Escola Politécnica, 58, 1250-102 Lisboa, Portugal (e csergio@fc.ul.pt); ²Centro de Estudos Florestais, Instituto Superior de Agronomia, Universidade Técnica de Lisboa, Tapada da Ajuda, 1349-017, Lisboa, Portugal

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