

Short note

Stellarangia namibensis (Teloschistaceae) out of the Namib Desert

Joana MARQUES^{1*}, Frederico SANTARÉM², José Carlos BRITO³

¹Museu de História Natural e da Ciência da Universidade do Porto, Praça de Gomes Teixeira, 4099-002 Porto, Portugal

^{1,2,3}CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, InBIO Laboratório Associado, Campus de Vairão, Universidade do Porto, 4485-661 Vairão, Portugal

^{1,3}BIOPOLIS Program in Genomics, Biodiversity and Land Planning, CIBIO, Campus de Vairão, 4485-661 Vairão, Portugal

^{1,3}Departamento de Biologia, Faculdade de Ciências, Universidade do Porto, 4099-002 Porto, Portugal.

*Correspondence: joanamendonca@gmail.com

¹<https://orcid.org/0000-0003-3702-9782>, ²<https://orcid.org/0000-0003-3271-1627>

³<https://orcid.org/0000-0001-5444-8132>

Abstract. During lichenological fieldwork along the coast of the Atlantic Sahara, Morocco, we collected some remarkably long lobed “*Caloplaca*” specimens, which turned out to be *Stellarangia namibensis*. This is the first record of this species in the northern hemisphere, and represents a significant extension of the known range of a lichen previously thought to be endemic to the Namib Desert.

Resumen. Durante campañas de muestreo de líquenes a lo largo de la costa del Sáhara Atlántico en Marruecos, recolectamos algunos especímenes de “*Caloplaca*” con lóbulos notablemente largos que resultaron ser *Stellarangia namibensis*. Se trata del primer registro de la especie en el hemisferio norte y representa una extensión significativa de la distribución de una especie que hasta ahora se creía endémica del desierto de Namibia.

Keywords. Africa, Biogeography, *Caloplaca*, lichens, Sahara.

Palabras clave. África, Biogeografía, *Caloplaca*, líquenes, Sáhara.

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Stellarangia namibensis (Kärnefelt) Frödén, Arup & Søchting was originally described by Kärnefelt (1988) as *Caloplaca namibensis* Karnef. based on his own material, collected in Namibia, and that of Welwitsch from southern Angola (Benguela). According to Kärnefelt (1988), *C. namibiensis* is close to *Caloplaca elegantissima* (Nyl.) Zahlbr., and differs from *C. namibensis* mainly by the presence of isidia, which are absent in *C. elegantissima*, as well as by the lobe width, which is narrower in *C. namibensis* (0.2–0.5 mm) than in *C. elegantissima* (0.5–1.8 mm). The author also pointed out to the difference in the separation between lobes and the thickness of the epinecral layer, observing a lower distance between lobes and a thinner epinecral layer in *C. namibensis*. The other species in the group, *C. testudinea*, is also isidiate, but in this case lobes are usually much shorter to sometimes absent (Wirth & al. 2005).

In the most recent classification of the family Teloschistaceae, Arup & al. (2013) proposed the monophyletic

genus *Stellarangia* to accommodate three species occurring in the deserts of south-western Africa and developing “beautiful long lobes”: *Stellarangia elegantissima* (Nyl.) Frödén, Arup & Søchting, *S. namibensis* and *S. testudinea* (V.Wirth & Kärnefelt) Frödén, Arup & Søchting.

The Atlantic Sahara specimens examined in this study are sterile, covered by isidia, mostly simple and scattered, but sometimes becoming clustered towards the centre of the thallus, and then appearing coralloid. Lobes are narrow, never exceeding 0.5 mm in width, mostly closely adpressed but occasionally more separated, and even disjunct. Such variation appears to be dependent on thallus developmental stage and/or determined by substrate microtopography. The surface is orange (K+ purple) to salmon pigmented due to a strongly developed white epinecral layer, which can leave the centre of the thallus virtually white (Fig. 1b). The epinecral layer is absent at the lobe tips but can be up to 50 µm thick towards the centre. Cortex is as described by Kärnefelt (1988), i.e. composed of strongly gelatinized

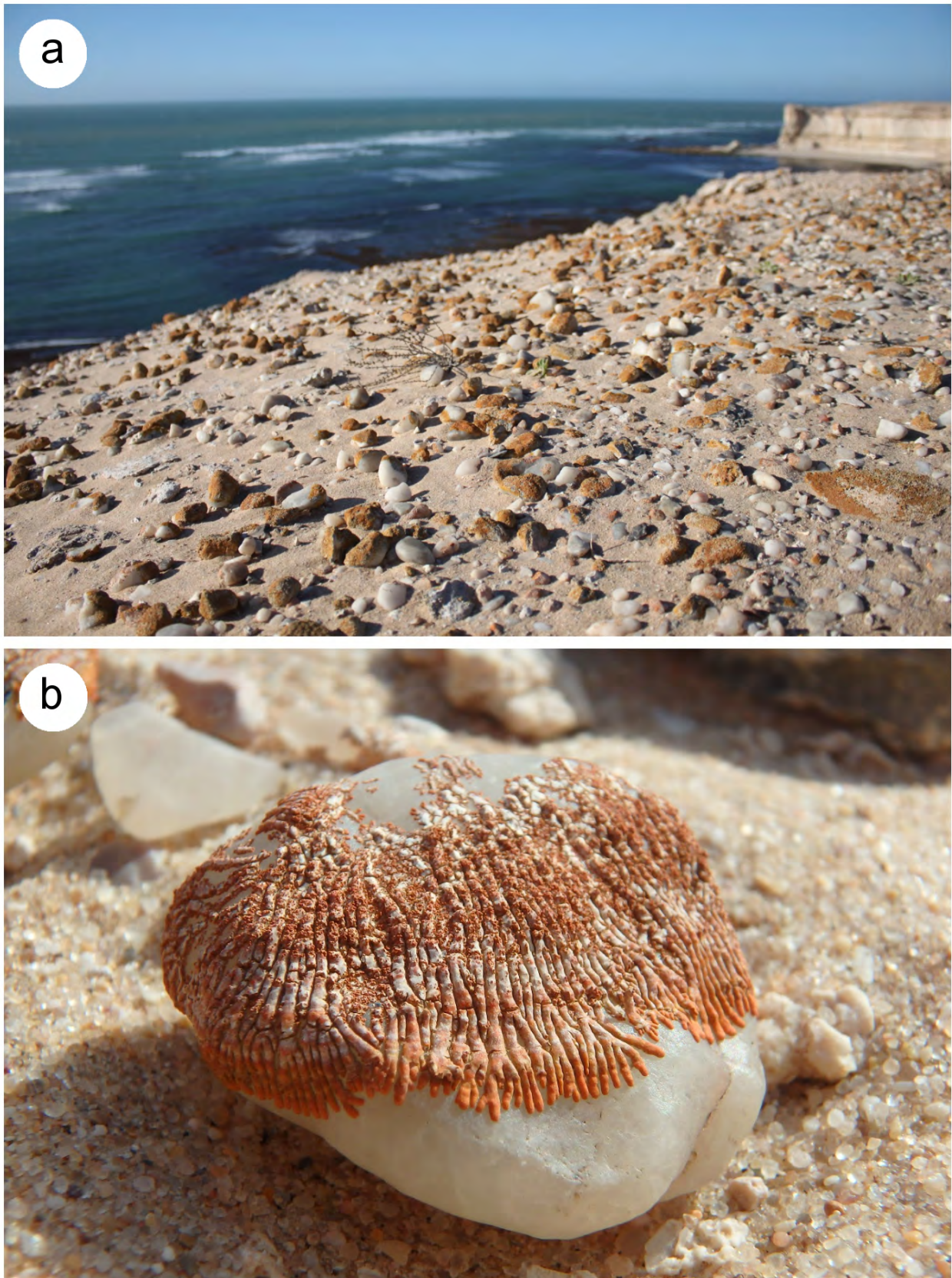


Fig. 1. *Stellarangia namibensis* (Kärnefelt) Frödén, Arup & Sochting from the Atlantic Sahara, Morocco: **a**, habitat; **b**, specimen on a quartz pebble, showing the characteristically thin long lobes, the central portions covered with minute isidia.

hyphae that are mostly hyaline, with an orange-yellowish thin layer above, but is sometimes reduced to the pigmented layer directly contacting, and partially involving, the characteristic algal clusters. Algal clusters are frequently separated by hyphae stacks extending downwards from the cortex.

These specimens were found on January 5, 2016, about 6 km north of Sabkhat Fares (22.579995N, 16.35907W). They were growing on white quartz pebbles embedded in the sandy and gravelly coastal cliffs of the Hamada Plateau (Fig. 1a), which is in agreement with Kärnefelt's description of the ecology of *Caloplaca namibensis* in the Namib Desert (Wirth 2010; de los Ríos & al. 2022). The climate is hot (average daily maximum temperature of 23°C) and arid, with scarce amounts of episodic rainfall (average less than 20 mm annual rainfall). Fogs blown in from the Atlantic are common, which condense and supply the majority of moisture needed for lichens to grow. The whole area is influenced by the cold Canary Current which flows southwards from the northern Atlantic Ocean along the north-western coast of Africa.

Our proposed explanation for the occurrence of *Stellarangia namibensis* in this particular locality of north-western Africa is a combination of the favourable environmental conditions of the Atlantic Coastal Desert, similar to the conditions found in the Namib Desert, and the suitable substrate for its growth provided by the stable quartz pebble field, which seems to be uncommon in this region, contrary to what happens in the Namib (Schieferstein & Loris 1992; de los Ríos & al. 2022).

The number of accompanying species in the locality was remarkably low. The most conspicuous was *Elenkiniana gloriae* (Llimona & Werner) S.Y.Kondr., Kärnefelt, Elix, A. Thell, Jung Kim, A.S.Kondr. & Hur., but *Buellia vandenboomii* Giralt & Brand, *Diploicia canescens* (Dicks.) A.Massal., *Diploctoma alboatrum* (Hoffm.) Flot., *Niebla bourgaeana* (Mont. ex Nyl.) Rundel & Bowler (salazinic acid chemotype) and *Ramalina maciformis* (Delise) Bory, were also present. *Buellia vandenboomii* is a new report for continental Africa. We searched for *S. namibensis* in other localities along the coast of the Atlantic Sahara, from Cape Bojador down to the border with Mauritania and no further occurrences were noted. Future survey efforts focused on finding suitable habitats for *S. namibensis* along the north-western African coast might well include this and other unexpected lichen taxa.

Specimens examined and comments

Stellarangia namibensis (Kärnefelt) Frödén, Arup & Søchting.—MOROCCO. **Dakhla-Oued Ed-Dahab:** Oued Ed-Dahab Province, N of Sabkhat Fares, 22.579995N, 16.35907W, on quartz pebbles, 5 Jan. 2016, J.C. Brito [PO-

L9756]; *ibid.*, 4 Apr. 2017, J. Marques [PO-L9759, PO-L9760, PO-L9761, PO-L9762].

Elenkiniana gloriae (Llimona & Werner) S.Y.Kondr., Kärnefelt, Elix, A.Thell, Jung Kim, A.S.Kondr. & Hur.—MOROCCO. **Dakhla-Oued Ed-Dahab:** Oued Ed-Dahab Province, N of Sabkhat Fares, 22.579995N, 16.35907W, on quartz pebbles, 5 Jan. 2016, J.C. Brito [PO-L9757]; *ibid.*, 4 Apr. 2017, J. Marques [PO-L9765, PO-L9766].

A presumed synonym of *Elenkiniana gomerana* (J.Steiner) S.Y.Kondr., Kärnefelt, Elix, A. Thell, Jung Kim, A.S.Kondr. & Hur (Gaya & al. 2003) characterised by the thick effigurate thallus with numerous pseudocyphellae (Kondratyuk & al. 2014). Previously known from southern Spain (Andalucía), the Canary Islands and Morocco (Llimona & Werner 1975). Our records extend the known distribution of the species in North Africa towards the south in the Atlantic Coastal Desert.

Buellia vandenboomii Giralt & M.Brand.—MOROCCO. **Dakhla-Oued Ed-Dahab:** Oued Ed-Dahab Province, N of Sabkhat Fares, 22.579995N, 16.35907W, on *Diploctoma alboatrum* (Hoffm.) Flot and directly on calcareous stones, 4 Apr. 2017, J. Marques [PO-L9764b].

Previously known only from the type locality in the Canary Islands, this lichen is distinguished from other xanthone-containing species of the genus *Buellia* (Giralt & al. 2009) by the small, smooth *Physconia*-type ascospores, the presence of an aeruginose, N+ red-violet pigment in the epihymenium, and well developed thick, areolate, yellow thallus lacking norstictic acid. Our specimen differs from the original description in thallus colour (white to very pale yellow) and habitat (on calcareous stones instead of volcanic rocks).

Diploicia canescens (Dicks.) A.Massal.—MOROCCO. **Dakhla-Oued Ed-Dahab:** Oued Ed-Dahab Province, N of Sabkhat Fares, 22.579995N, 16.35907W on calcareous stones, 5 Jan. 2016, J.C. Brito [PO-L9758a].

Diploctoma alboatrum (Hoffm.) Flot.—MOROCCO. **Dakhla-Oued Ed-Dahab:** Oued Ed-Dahab Province, N of Sabkhat Fares, 22.579995N, 16.35907W, on calcareous stones, 4 Apr. 2017, J. Marques [PO-L9764a].

Niebla bourgaeana (Mont. ex Nyl.) Rundel & Bowler.—MOROCCO. **Dakhla-Oued Ed-Dahab:** Oued Ed-Dahab Province, N of Sabkhat Fares, 22.579995N, 16.35907W, on calcareous stones, 5 Jan. 2016, J.C. Brito [PO-L9758b].

A Mediterranean-African species characterized by the cuculate, rigid, strongly reticulately ridged laciniae and abundant apothecia, that are mostly laminal (Krog & Østhaugen 1980, Aptroot & Schumm 2008).

Ramalina maciformis (Delile) Bory.—MOROCCO. **Dakhla-Oued Ed-Dahab:** Oued Ed-Dahab Province, N of

Sabkhat Fares, 22.579995N, 16.35907W, on quartz pebbles, 4 Apr. 2017, J. Marques [PO-L9763].

An African-Arabian species distinguished from the previous one by the presence of an irregular network of large cracks exposing the medullary layer, from which granular soredia originate (Krog & Østhaugen 1980, Aptroot & Schumm 2008).

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