MYCOTAXON

*Volume 97, pp. 67–71* *July–September 2006*

# An appraisal of the syntype material of *Caloplaca aurantiomurorum* (*Teloschistaceae*, lichenized fungi)

Jan Vondrák* & Jaroslav Šoun

**j.vondrak@seznam.cz*
*Department of Botany, Faculty of Biological Sciences*
*University of South Bohemia*
*Branišovská 31, CZ-370 05, České Budějovice, Czech Republic*

**Abstract**—Sample no. 54 of Flagey: Lichenes Algerienses exsiccati represents the syntype of *Placodium aurantiomurorum* (≡ *Caloplaca aurantiomurorum*). However, the samples of this exsiccatum distributed to FH, H, M, PC and UPS contain different lichen species. The lectotype of *P. aurantiomurorum* is selected here (sample in UPS) and this name is treated as a synonym to *Caloplaca aurantia*. In this exsiccatum, *Candelariella senior* has been identified (in H, FH, and PC), which is reported here as a new species to Algeria. The known distribution of *Can. senior* is described.

**Key words**—lichens, nomenclature, typification

## Introduction

*Placodium aurantiomurorum* was described by Flagey (1891: 112) from Algeria "Rochers humides de Sidi-Mecid et seulement là") in the exsiccatum "Flagey: Lichenes Algerienses exsiccati (no 54)". This exsiccate collection was distributed to the herbaria FH (nos 1-200), H, M, PC, and UPS (Grummann 1974: 277). The specimen in the herbarium of the University of Helsinki (H) was investigated, it being the only representative of *Caloplaca aurantiomurorum* (Flagey) Zahlbr. in the section. Surprisingly, it clearly belonged to the genus *Candelariella*, which we later determined as *Can. senior* Poelt. Subsequently, we investigated more samples of this exsiccatum (FH, M, PC, UPS) and found that individual exsiccates represent different species of *Caloplaca* (= *Cal.*) and *Candelariella* (= *Can.*).

## Materials and Methods

Apart from the investigated exsiccates, reference materials of *Caloplaca aurantia* (Pers.) Hellb., *Cal. flavescens* (Huds.) J.R.Laundon, *Cal. saxicola* (Hoffm.)

Nordin, and *Candelariella senior* from the herbaria CBFS, GZU, M, PRC, and PRM were used. Light microscopy measurements of ascospore characteristics, to an accuracy of 1 μm, were performed on hand-made sections examined in water at a magnification of ×1000. These measurements are given as MIN–X (±SD)–MAX, where X = mean value, SD = standard deviation, and MIN and MAX = extremes. Ten measurements (five ascospores in two apothecia) were examined in all samples except that from H, where the numbers of measurements (n) are given in parentheses.

## Results

The material in FH has a yellow-orange, rosette-like thallus with broad and flat lobes. Mature, well-developed ascospores are citriform, 12–14.2 (±1.1)–16 × 8–9.3 (±0.7)–10 μm, with septa 3–4.2 (±0.6)–5 μm wide. This specimen is morphologically identical with typical *Caloplaca aurantia*. *Candelariella senior* (morphologically identical with the material from H) and a small piece of an undetermined *Caloplaca* with a granular thallus are also present in this collection.

The material in H has *Candelariella*-type asci, simple ascospores, and a thallus and apothecia devoid of anthraquinones; therefore it belongs to *Candelariella*, not to *Caloplaca*. This rosette-like lichen was morphologically and anatomically compared with the holotype specimen of *Candelariella senior* (M, 0099854). Both samples are identical in most characters, differences were only observed in the thallus thickness [100–170 (±44)–250 μm (n=12) in "*Cal. aurantiomurorum*" vs. 120–228 (±66)–310 μm (n=10) in *Can. senior*] and in the spore width [10–12.5 (±1.2)–15 × 4–5.3 (±0.6)–6 μm (n=18) in "*Cal. aurantiomurorum*" vs. 10–12.0 (±1.7)–16 × 3–4.0 (±0.5)–5 μm (n=10) in *Can. senior*].

The material in M (M-0100101) has an orange, rosette-like thallus with short broad marginal lobes. Mature ascospores are ellipsoid, never citriform, 10–11.0 (±0.5)–12 × 6–6.1 (±0.3)–7 μm, with septa 3–3.4 (±0.5)–4 μm wide. This specimen is morphologically identical with typical *Caloplaca saxicola*.

The material in PC (PC0107050) is on two pieces of stone (glued on a sheet). The upper one is only covered by a fertile lichen with yellow-orange, rosette-like thallus with broad and flat marginal lobes. Mature, well-developed ascospores are citriform 13–14.1 (±1.2)–16 × 9–10.4 (±1.0)–12 μm, with septa 4–4.5 (±0.7)–6 μm wide. This specimen is morphologically identical with typical *Caloplaca aurantia*. The lichenicolous fungus *Cercidospora caudata* Kernst. occurs in its apothecia. *Cal. aurantia* also prevails on the lower stone, but *Candelariella senior* and an undetermined granulose *Caloplaca* are admixed.

The material in UPS has a yellow-orange, rosette-like thallus with broad and flat lobes. Mature, well-developed ascospores are citriform, 13–14.6 (±0.8)–16

× 8–9.7 (±0.9)–11 µm, with septa 4–4.9 (±0.7)–6 µm wide. This specimen is morphologically identical with typical *Caloplaca aurantia*. This sample is selected here as the lectotype.

## Discussion

The short Latin diagnosis of *Placodium aurantiomurorum* (Flagey 1891: 112) is translated as follows: "Thallinal lobes flatter than in *P. murorum* (= *Caloplaca saxicola*); spores 16–18 × 8–9 µm, wider than in *P. murorum* and with a shape as in *Physcia aurantia* (= *Cal. flavescens*)". The extended French description (Flagey 1896: 28), where *Placodium aurantiomurorum* was compared with *P. murorum*, *P. callopismum* (= *Cal. aurantia*) and *P. heppianum* (= *Cal. flavescens*), is translated as follows: "Thallus fairly yellow suede with lobes larger and more flattened than in *P. murorum*, resembling lobes of *P. callopismum*, but with lobes yellow, less reddish. Spores ovoid, 'placodial' 16–18 × 8–9 µm, larger than in *P. murorum*, strongly resembling spores of *P. heppianum*, whose thallus is clearly different".

Based on these descriptions, *Cal. aurantiomurorum* is distinct from *Cal. saxicola* by having a different shape and size of the thallus and a different shape of spores and from *Cal. flavescens* by having a different shape of lobes. However, *Cal. aurantiomurorum* is distinguished from *Cal. aurantia* only by the yellow colour of the thallus. Based on this and the syntype investigation, we decided to place the name *Cal. aurantiomurorum* into the synonymy of *Cal. aurantia*.

In the protologue, Flagey (1891: 112) described one locality but did not designate the holotype. His main herbarium is located in PC and following the usual practice for exsiccates, the sample placed there should be regarded as the holotype and the others as isotypes. In this case, however, due to the heterogeneity of the respective material, we treat all exsiccate samples as syntypes. We have selected the sample in UPS as the lectotype, because it is well-preserved and without any admixture of similar lichen species (cf. the mixture represented by the specimen in PC). The sample in UPS was already revised as *Cal. aurantia* and mentioned in the list of exsiccates of this species by Nordin (1972: 80). This specimen was indicated as an isotype although the typification was not published.

*Cal. aurantiomurorum* has only been reported on calcareous rocks in Sidi-Mecid near Azéba fort and in Djebel Akar Mts in Algeria (Flagey 1896: 28) and in Upper Galilee, Mt Carmel in Israel (Alon & Galun 1971: 287-288). *Cal. aurantiomurorum* was accepted in two lichen checklists of Israel (Galun & Mukhtar 1996: 152, Kondratyuk et al. 1996: 35), until the voucher material from Israel was redetermined as *Cal. flavescens* (Wasser & Nevo 2005: 100) and the name *Cal. aurantiomurorum* was excluded from the Israel lichen flora

(Wasser & Nevo 2005: 321) and erroneously put into the synonymy of *Cal. flavescens* (Wasser & Nevo 2005: 99).

The sample in H and parts of the samples in FH and PC belong to the lobate species of *Candelariella*. In southern Europe, three lobate species are known, *Can. medians*, *Can. rhodax*, and *Can. senior*. While the two former species are clearly different (Poelt & Vězda 1976, 1977), the latter fits well with the respective samples. The differences in the thallus thickness and spore width between the holotype specimen of *Can. senior* and the sample in H can be easily accounted for by intraspecific variation. Having seen more material of *Can. senior* from GZU, we consider them conspecific with the samples of the investigated exsiccatum. Previously, *Can. senior* was only known from the type locality in Spain (Poelt 1958: 440-441), and from Libya (Thor, unpublished data) and Tunisia (cf. Seaward 1996: 123) so far.

Other samples of *Can. senior* seen: **Algeria.** on limestone in "d'Azeba" (GZU, intermixed in sample Flagey: Lich. Alg. Exsic. 93, *Rinodina subconfragosa*). **Libya.** On calcareous stone near Derna (Darnah), Thor, 1982 (GZU). **Tunisia.** Douggha, Poelt, 1968 (GZU); Djebel Goraa Mts, between Thibar and Teboursouk, Poelt, 1968 (GZU).

## Conclusions

Flagey's exsiccatum of *Placodium aurantiomurorum* is composed of heterogeneous material. The samples in FH, PC and UPS are taxonomically indistinguishable from *Cal. aurantia*, and the sample in M is indistinguishable from *Cal. saxicola*. The sample in UPS is selected here as the lectotype of *Placodium aurantiomurorum* and we propose to put the name *Cal. aurantiomurorum* into the synonymy of *Cal. aurantia*. We consider the sample of *Cal. aurantiomurorum* in H and the admixed lichens in samples from FH and PC conspecific with *Candelariella senior*, which is newly reported from Algeria.

In the light of this work, more attention should be given not only to examining distributed material of this particular exsiccatum in other herbaria, but also to appraising the homogeneity of exsiccati in general.

### Acknowledgements

We thank the curators of the herbaria mentioned in the text for their valuable help with the loans of material, Prof. Mark Seaward, Dr Walter Obermayer, and Prof. Solomon P. Wasser for their valuable comments on the manuscript. We are grateful to Marek Stibal and Prof. Mark Seaward for linguistic corrections.

### Literature cited

Alon G, Galun M. 1971. The genus *Caloplaca* in Israel. Israel Journal of Botany 20: 273-292.

Flagey C. 1891. Lichenes Algerienses exsiccati. Revue Mycologique 13: 107-117.

Flagey C. 1896. Catalogue des lichens de l'Algérie. 1-140, in: Battandier JA, Trabut L., Flore de l'Algérie. 2.

Galun M, Mukhtar A. 1996. Checklist of the lichens of Israel. Bocconea 6: 149-171.

Grummann V. 1974. Biographisch-bibliographisches Handbuch der Lichenologie. Lehre, Verlag von J. Cramer.

Kondratyuk SY, Navrotskaya IL, Zelenko SD, Wasser SP, Nevo E. 1996. The first checklist of lichen-forming and lichenicolous fungi of Israel. Kyiv, M. G. Kholodny Institute of Botany & International Centre for Cryptogamic Plants and Fungi.

Nordin I. 1972. *Caloplaca* sect. *Gasparrinia* in Nordeuropa. Uppsala, Taxonomiska och Ekologiska Studier. Skriv Service AB.

Poelt J. 1958. Die lobaten Arten der Flechtengattung *Lecanora* Ach. sensu ampl. in der Holarktis. Mitteilungen der Botanischen Staatssammlung München 2: 411-573.

Poelt J, Vězda A. 1976. *Candelariella plumbea* und *C. rhodax* sp. novae, zwei neue Arten der europäischen Flechten-Flora. Folia Geobotanica et Phytotaxonomica 11: 87-92.

Poelt J, Vězda A. 1977. Bestimmungsschlüssel europäischer Flechten. Ergänzungsheft I. Bibliotheca Lichenologica 9: 1-258.

Seaward MRD. 1996. Checklist of Tunisian lichens. Bocconea 6: 115-148.

Wasser SP, Nevo E. (eds.) 2005. Lichen-forming, lichenicolous and allied fungi of Israel. Ruggell, A.R.G. Gantner Verlag K.G.