
***Kallymenia feldmannii* Codomier (*Kallymeniaceae*, Rhodophyta): effective publication, valid publication, typification and current taxonomic status**

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This investigation concerns the effective publication, valid publication, typification, and current taxonomic status of *Kallymenia feldmannii* Codomier (*Kallymeniaceae*, Rhodophyta), based on the *International Code of Nomenclature for algae, fungi and plants (Shenzhen Code)* (Turland *et al.* 2018). Terminology follows that used in the ICN (hereafter meaning the Shenzhen Code). The use of double quotation marks (e.g. “*Kallymenia feldmannii*”) to indicate binary designations (see below) follows Turland *et al.* (2018: 205).

Effective publication (ICN Art. 6.1, 29-31) of “*Kallymenia feldmannii*” first occurred in Huvé & Passelaigue (1970: 48). Huvé & Passelaigue (1970), however, did not provide a description or diagnosis or a reference to a previously and effectively published description or diagnosis (ICN Art. 38.1), and they did not indicate a nomenclatural type (ICN Art. 40.1). Thus, Huvé & Passelaigue (1970: 48) did not validly publish (ICN Art. 6.2, 32-45) a scientific name (ICN Preamble 1) but instead established a binary designation (ICN glossary) with no status under ICN Art. 12.1. Huvé & Passelaigue (1970: 48) ascribed the binary designation to Codomier and included the Codomier (1968) thesis in their References.

The Codomier (1968) thesis is a one-volume, 288-page, typewritten (not printed) document reproduced by mimeographing and lacking an ISBN, a statement of the name of a printer, or any other internal evidence of effective publication in accord with ICN Art 30.9 and Art. 30, *Note 3* (also see Art 30, *Ex. 14-19*). Thus, the Codomier (1968) thesis is not effectively published, and consequently new “names” in the thesis are not validly published and have no status under ICN Art. 12.1.

“*Kallymenia feldmannii*” next appeared as a binary designation in Codomier (1972a: 57), a subsequent two-volume thesis dated 23 February 1972 but not effectively published in accord with ICN Art. 30.9 because it lacks an International Standard Book Number (ISBN) or a statement of the name of a printer, or other internal evidence (ICN Art. 30, *Note 3*) that the work was intended to be effectively published. Each volume has a printed cover and identical title page without the name of a printer; the remainder of the text is typewritten (not printed) and appears only on one side of each subsequent page. The typewritten sheets probably were duplicated (mimeographed) from wax stencils using an office duplicating machine. The end page of volume II (Fig. 1) contains information about where the typing and mimeographing occurred, the person who did the typing and the person who provided technical aid. Unfortunately, Athanasiadis (2016: 653, footnote 9; 1432: footnote 1) misinterpreted this end page as including a statement of the name of a printer and consequently incorrectly considered the thesis to be effectively published.

We also sought the view of Nicholas Turland, Chair of the Editorial Committee responsible for preparing the ICN (Shenzhen Code), as to whether the 1972 Codomier thesis (i.e., Codomier 1972a) was effectively published. He agreed that it was not effectively published, amongst other reasons because “it was mimeographed by the universities and not printed by a commercial printer”.

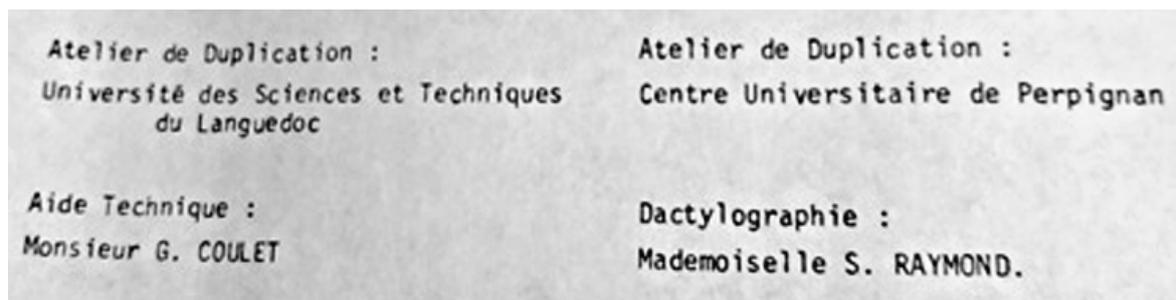


Fig. 1. Information on end page of Vol. II of Codomier 1972a concerning typing and place of duplication (by mimeographing).

Four months later (June 1972), Codomier (1972b: 36) effectively published (ICN Art 29-31) “*Kallymenia feldmannii* Codomier” in Vol. XXII, fascicle 1-A of *Vie et Milieu* in a paper dealing with Mediterranean species of *Kallymenia*. Vol. XXII fascicle 1-A of the journal is dated 1971, and that date appears in the header of the first page of the Codomier paper, but fascicle 1-A did not appear until June 1972 (indicated at the bottom of the last page of fascicle 1-A). The paper was first received by the journal on 9 June 1970 (noted in Codomier 1972b: 54), 20 months before the date on his 1972 thesis.

Codomier (1972b: 36) provided a Latin diagnosis and complied with most other provisions of ICN Art. 32-45, but he did not indicate or designate a nomenclatural type (Art 40.1) from amongst the individuals mentioned (*op. cit.*, pp. 36, 38) and thus did not publish a valid scientific name. In the references, Codomier (1972b) cited both his 1968 thesis and Huvé & Passelaigue (1970), but not his 1972 thesis (Codomier 1972a).

As far as we have determined, the first attempt to designate a nomenclatural type for “*Kallymenia feldmannii*” did not occur until Vergés (2005: 76-98) published a detailed account of “*Kallymenia feldmannii*” that included the citation of a ‘Tipus’ with the statement (in Catalan) “*Recollectat per Louis Codomier el 13 de setembre de 1965 a cap l’Abeille (Banyuls de la Marenda, França), a 18 m de fondària. Aquest autor no va especificar el número d’identificació d’aquest exemplar*”. Unfortunately, however, the single herbarium, collection, or institution in which the type was conserved was not specified as required by ICN Art. 40.7 (also see Art. 40, *Ex. 9*), and thus nomenclatural validation of “*Kallymenia feldmannii*” did not occur.

Vergés (2005) account of “*Kallymenia feldmannii*” formed part of a thesis that bears both an International Standard Book Number (ISBN: 84-689-4859-4) and a Spanish Legal Deposit number (Dipòsit legal: GI-1269-2005) and thus is effectively published (ICN Art. 30.9 & Art 30, *Note 3*). The claim (Athanasiadis 2016: 1492, footnote 2) that Vergés (2005) is not effectively published because it is not distributed to the general public or to scientific institutions with generally accessible libraries is incorrect. Spanish Legal Deposit is governed by Spanish law (see Gallent 1962 & Government of Spain 2011 in the references below), which requires the deposit of several copies in public libraries. These deposits include printed copies that are generally accessible at the Biblioteca Universitat de Girona (University of Girona Library) and the Biblioteca Nacional de Catalunya (National Library of Catalonia); a pdf is available at <https://tinyurl.com/ya6zlkuo>.

“*Kallymenia feldmannii*” was still a binary designation when Rodríguez-Prieto & Hommersand (2009: 141) satisfied most requirements for valid publication, cited the same specimen as Vergés (2005), and indicated where the specimen was conserved. Rodríguez-Prieto & Hommersand (2009:141), however, referred to the specimen as a syntype, namely: “SYNTYPE: Cap l’Abeille, Banyuls sur Mer, France, 13 September 1965, 18-m depth, collected by Louis Codomier [in the author’s herbarium at Perpignan].”

Unfortunately, Rodríguez-Prieto & Hommersand (2009: 141) did not use the term “*typus*” or “*holotypus*” or an equivalent in a modern language as required by ICN Art. 40.6 when publishing a new species name. Consequently, they did not satisfy a missing requirement (the proper designation of a holotype) for valid publication of “*Kallymenia feldmannii*” as a scientific name. Moreover, as indicated in ICN Art. 9.2 (new in the *Shenzhen Code*), and exemplified in ICN Art. 40 *Ex. 5* (also see Art. 40, *Ex. 7*), correction of ‘*syntype*’ or another term to ‘*holotype*’ is not permitted under ICN Art. 40.6 for an intended new species name published on or after 1 January 1990. Consequently, “*Kallymenia feldmannii*” remained invalid and without status under ICN Art 12.1. So-called ‘*syntypes*’ or any other sort of ‘*types*’ of (invalid) binary designations have no status under the ICN (*Shenzhen Code*), and thus no corrections are possible under ICN Art. 9.10. Because ICN Art 9.2 is retroactive (ICN Principle VI), and because “*K. feldmannii*” is invalid, the change of ‘*syntype*’ to ‘*holotype*’ in Athanasiadis (2016: 649, footnote 15) is incorrect, and citing the authorship as *Kallymenia feldmannii* Codomier *ex* Rodríguez-Prieto et Hommersand (Athanasiadis 2016: 649) also is incorrect.

As far as we know, *Kallymenia feldmannii* has yet to be validated as a new scientific name in accord with the ICN. Therefore, we provide the following validation:

Kallymenia feldmannii* Codomier, *sp. nov.

Full and direct reference to a previously and effectively published Latin diagnosis [as required by ICN Art. 38.1, 38.13]: Codomier, L., in *Vie et Milieu* 22 (Fascicle 1, série A): 36, June 1972 (Codomier 1972b: 36). This diagnosis also appeared in the theses of Codomier (1968, 1972a) and was reproduced in Vergés (2005: 76).

Holotype: FRANCE, Cap l'Abeille, Banyuls-sur-Mer; depth 20 m; 21 September 1966; *Typus*: PC0501123, conserved in the Feldmann Herbarium at **PC** (Herbier Cryptogamique, Muséum National d'Histoire Naturelle, Paris, France). Specimen also labelled “Herbier Louis Codomier N° 410”.

Illustration of Holotype specimen: Fig. 2 (this paper).

Priority: For nomenclatural priority, the scientific name *Kallymenia feldmannii* dates from the date of valid publication (12 January 2019) (ICN Art 33.1) (*Shenzhen Code*), not from the date of effective publication (Huvé & Passelaigne 1970) (ICN Art 6.1) or the date of first appearance (Codomier 1968) in a document that is not effectively published.

The specimen mentioned by Codomier (1972b: 36), Vergés (2005: 76), Rodríguez-Prieto & Hommersand (2009: 141) and Athanasiadis (2016: 649), collected on 13 September 1965 at Cap l'Abeille, Banyuls-sur-Mer at a depth of 18 m, could not be found, nor could we find any information on the current location of Codomier's herbarium. Rodríguez-Prieto & Hommersand (2009: 141) indicated that the herbarium was at Perpignan, but all attempts to locate the herbarium in the city of Perpignan and elsewhere were unsuccessful. Consequently, we chose PC0501123 as holotype, the identification of which was confirmed by Alba Vergés in October 2015.

The only extant Codomier specimen of *Kallymenia feldmannii* known to us (Fig. 2), housed in the Feldmann herbarium at **PC**, was collected in 1966 at the same locality at the same time of year as the 1965 specimen mentioned by other authors (above). The designation here of PC0501123 as holotype fixes the application of the species name (ICN Art. 9.1).

Although the species is newly described in this paper, we have attributed authorship of the name to Codomier (Louis A. Codomier) because Codomier (1968) was the first person to recognise the species as new, and because previous citations of “*K. feldmannii*” as a binary designation consistently credit Codomier with authorship. This ascription is in accord with ICN Art. 46.2. Because the author of the name and the authors of the publication in which the name is validly published differ, the name can be cited either as *Kallymenia feldmannii* Codomier, or, when

appropriate (see Art. 46, Note 2) (Shenzhen Code), as *Kallymenia feldmannii* Codomier (in Woelkerling, Cormaci & Furnari (2019: 3). If it is necessary to distinguish between use of the binomial as a scientific name and use as a binary designation, the latter can be enclosed in double quotation marks (i.e. “*Kallymenia feldmannii*”), as done in Turland *et al.* (2018: 205).

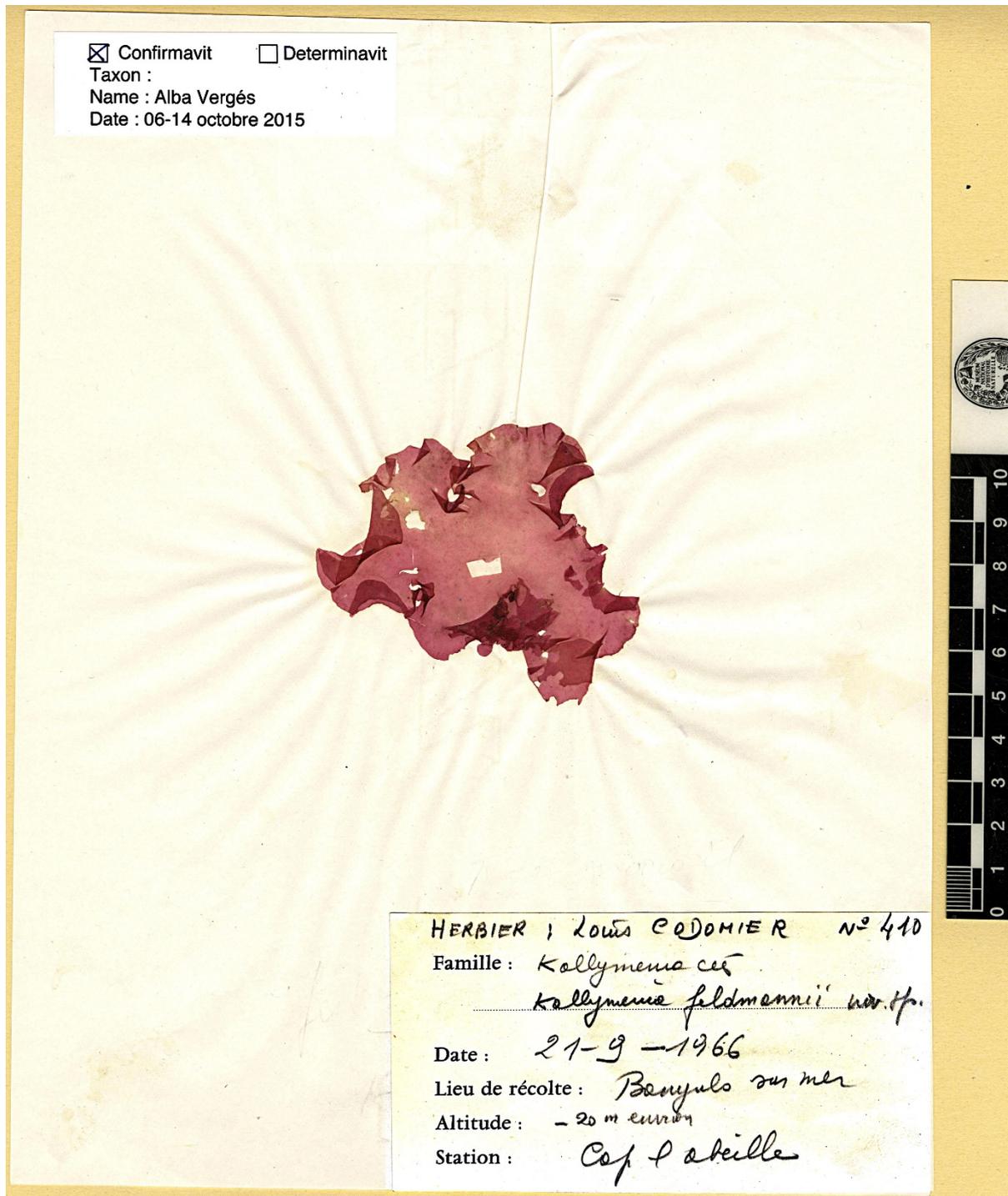


Fig. 2. Holotype of *Kallymenia feldmannii* (PC0501123). See text for details. Scale is in cm.

Kallymenia feldmannii Codomier currently is treated as a distinct species within the genus *Kallymenia*. Vergés *et al.* (2014: 340) summarised morphoanatomical similarities and differences between polycarpogonial species of *Kallymenia*, including *K. feldmannii*, and, based on an initial phylogeny inferred from *cox1* (COI), *rbcL* and nuclear LSU sequences, resolved that *K. feldmannii* belongs to the same lineage as the type species of *Kallymenia*, *K. reniformis* (Turner) J. Agardh

(1842: 99). *Kallymenia feldmannii* is recorded mainly from the Mediterranean Sea; published records are summarised in AlgaeBase:

http://www.algaebase.org/search/species/detail/?species_id=1607.

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