The genus *Laurencia* (Rhodomelaceae, Rhodophyta) in the Canary Islands

M. Candelaria Gil-Rodriguez & Ricardo Haroun

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The genus *Laurencia* Lamouroux is a group of medium-sized, erect, fleshy or cartilaginous, red algae distributed from temperate to tropical waters.

During the last few years several collections along the coasts of the Canary Islands have shown the important role of the *Laurencia* species in the intertidal communities; however, it is rather problematic to identify many of the taxa observed, and it seems necessary to make a biosystematic review of this genus in the Macaronesian Region.

Lamouroux in 1813 established the genus with 8 species, but he didn't mention a type species. Critical systematic studies have been made by several authors, C. Agardh (1823, 1824), J. Agardh (1842, 1851, 1880), De Toni (1903, 1924), Yamada (1931), after reviewing many type specimens from different American and European Herbaria. Tseng (1943) studied the Hong-Kong species, Dawson (1944, 1963) reported on the Pacific Mexican species, Cribb (1958) on the Australian species (Southeastern Queensland), Duriratnam (1963) on species from Sri Lanka and Hollenberg & Abbott (1965) on the Californian species.


**Material and methods**

The morphology of the species were studied using the herbarium sheets deposited in the La Laguna University Herbarium (TFC Phyc.) as well as with fresh samples from the Canary Islands; the taxonomical characters were observed with binocular lens and optical microscope. The fresh samples were studied before and after fixation in 4% formalin in seawater, kept in a dark place and a part were included in the TFC Phyc.

The taxonomical characters used for the systematic of the genus over the specific level are:
Results

In the Canarian Area, only records and chorological data of some taxa are known.

The first species from the Canarian area was described by Bory St. Vincent (1804) as Fucus perforatus Bory [= Laurencia perforata (Bory) Montagne]. Until the recent studies of Viera-Rodriguez et al. (1987) the following species have been reported:

1) Laurencia bronnhiarii J. Agardh (Viera-Rodriguez 1965; Prud’Homme van Reine com. pers.)
2) Laurencia hybrida (DC.) Lenormand (Piccone 1884; Boergesen 1930; Levring 1974; Gil-Rodriguez & Afonso-Carrillo 1980; Audiffred & Weisscher 1984; Jorge et al. 1986; Prud’Homme van Reine com. pers.)
4) Laurencia paniculata (C. Agardh) J. Agardh (Audiffred 1985; Gonzalez 1986).
5) Laurencia papillosa (Forskaal) Greville (Piccone 1884; Gil-Rodriguez & Afonso-Carrillo 1980; Ribera et al. 1984; Jorge et al. 1986).
7) Laurencia pinnatifida (Hudson) Lamouroux (Montagne 1839-1941; Piccone 1884; Boergesen 1930; Levring 1974; Gil-Rodriguez & Afonso-Carrillo 1980; Lopez-Hernandez & Gil-Rodriguez 1982; Ribera et al. 1984; Gil-Rodriguez et al. 1985; Jorge et al. 1986; Gonzalez 1986; Prud’Homme van Reine com. pers.)
8) Laurencia tenera Tseng (Prud’Homme van Reine com. pers.)

Since 1987 we could not only collect all the above-mentioned species but also 4 identified other species and a number of which still remains unidentified. It is our intention to continue this investigation.

Records of species new to the Canary Islands

1) Laurencia corallopsis (Montagne) Howe (Taylor 1928 & 1960; Yamada 1931; Rodriguez de Rios & Saito 1982)
2) Laurencia flexilis Setchell (Setchell 1926; Yamada 1931; Boergesen 1945)
3) Laurencia majuscula (Harvey) Lucas (Saito 1969b; Saito & Womersley 1974; Lawson & John 1982)
4) Laurencia platycephala Kutzing (Magne 1980)
5) Laurencia sp. 1 (section Laurencia Saito)

Provisional key of the genus Laurencia in the Canary Islands

1) With secondary pit-connections between cortical cells ........................................ 2

(Subg. Laurencia Saito)

1* Without secondary pit-connections between cortical cells .............................. 3

2) Branches terete or subterete. Radial branching pattern ............................. Sect. Laurencia Saito
(L. majuscula, L. obtusa, L. tenera & L. sp. 1) ........................................ 4

2* Branches compressed. Complanate branching pattern ............................. Sect. Planae Saito & Womersley
(L. brogniartii)

3) Disposition of tetrasporangia in the stichidial pattern ............................. 4

Spermatangial receptacle of determinate position, cup-like and/or pocket-like type and without clear central axis. Tetrasporangia parallel type ........................... Subg. nov. Pinnatifida
(L. hybrida & L. pinnatifida) ................................................................. 5

4) Tetrasporangia right angle type .................................................. 5

(Subg. Chondrophyces Tokida & Saito)

4* Tetrasporangia parallel type .................................................. 5

5) Cortical cells elongate and palisade-like, thallus drying cartilagineous. Sect. Palissadaceae Yamada
(L. corallopsis, L. paniculata, L. papillosa & L. perforata) ........................................ 5

5* Cortical cells not elongate and not palisade-like, thallus not drying cartilagineous ........................... Sect. Chondrophyces Saito
(L. flexilis)

Conclusions

In this first contribution to the study of the genus Laurencia in the Canarian Archipelago, the number
of species have increased from eight to thirteen. The new records are: Laurencia corallopsis, L. flexilis, L. majuscula, L. platycephala and Laurencia sp. 1.

However, other taxa have been collected, although their taxonomic position needs more detailed research.

We have made a provisional systematic key to the subgenus and sections of Laurencia studied in our area.

Thirteen species have been identified. Eleven have been included in the subgenus Laurencia (sections Laurencia and Planae) and in the subgenus Chondrophycus (sections Chondrophycus, Palisade and and a new group “Platycephala”). Two species, L. pinnatifida and L. hybrida have been included in the new subgenus “Pinnatifida”.

We propose a third subgenus, Pinnatifida subgenus nov.: Longitudinal secondary pit-connections among the cortical cells are absent; the tetratemporangial arrangements are a parallel type and have adaxial cut-offs; the spermatangial receptacles are cup-like and/or pocket-like; cortical cells are not radially elongated and not palisade-like.

L. platycephala has not been included in section level, it remains as the “Platycephala” group, in the subgenus Chondrophycus. Its systematic position should be reviewed together with other compleanate species of the Subtropical Atlantic Area.

Differences between the subgenus and sections of the genus Laurencia

I. Subgenus Laurencia Saito

Longitudinal secondary pit-connections among the cortical cells are present; the tetratemporangial arrangements are parallel and abaxial; the spermatangial receptacles are cup-like; they are neither radially elongated nor arranged like cells when seen in a transection.

Section Laurencia Saito: the fronds are teretes or subteretes; lenticular thickenings are absent among the medullary cells.

Section Planae Saito & Womersley: the fronds are clearly compressed; lenticular thickenings are present among medullary cells.

II. Subgenus Chondrophycus Tokida & Saito

Longitudinal secondary pit-connections among the cortical cells are absent; the tetratemporangia are of a right angle or parallel type and abaxial; the spermatangial receptacles are cup-like.

Section Chondrophycus Saito: tetratemporangia right angle type; the cortical cells are not radially elongated and not palisade-like.

Section Palisadeae Yamada: tetratemporangia right angle type; the cortical cells are radially elongated and palisade-like.

Group “Platycephala” Gil-Rodriguez & Haroun: tetratemporangia parallel type; the cortical cells are not radially elongated and not palisade-like.

III. Subgenus Pinnatifida Gil-Rodriguez & Haroun

Longitudinal secondary pit-connection among the cortical cells are absent; the tetratemporangia parallel type and adaxial; the spermatangial receptacles are cup-like and/or pocket-like; cortical cells are not radially elongated and not palisade-like.

Fig. 1. The taxonomical characters used of the genus Laurencia LAMOURoux. - Secondary pit-connections between cortical cells: A = presence; B = absence. - Origin of tetratemporangia: C = adaxial; D = abaxial. - Disposition of tetratemporangia: E = parallel type; F = right-angle type. - Shape and disposition of spermatangial receptacle: G = cup-like; H = pocket-like.

Up to now, only eight species of Laurencia have been reported on the Canarian Coasts. However, a revision of La Laguna University Herbarium (TFC Phyc.) and with fresh collections made from 1987 to 1989 in several locations along the Canarian Coasts, have allowed us to add five new records to the Canarian Flora.

As a result of our morphological studies of thirteen Canarian species of Laurencia, we propose to establish a new subgenus “Pinnatifida” in the genus Laurencia. Besides, in the subgenus Chondrophycus another new group “Platycephala” is also proposed here.

References


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The authors' address
M.C. Gil-Rodriguez & R. Haroun, Departamento de Biologia Vegetal, Universidad de La Laguna, E-38271 La Laguna, Islas Canarias, España.