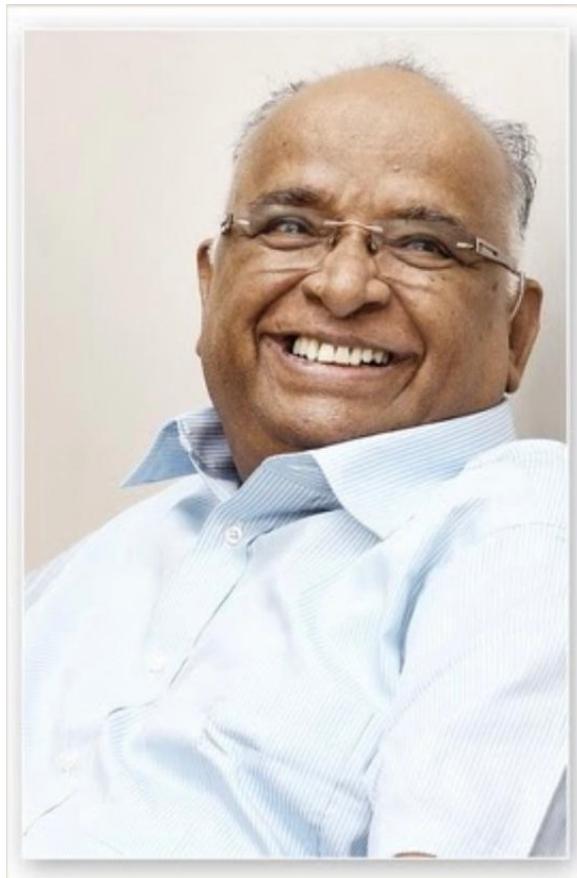


## Obituary: Edayathumangalam Kandaswamy Ganesan (1938-2021)

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Edayathumangalam Kandaswamy Ganesan (1938-2021; above) was born on 19<sup>th</sup> August 1938 in the small village of Edayathumangalam from which his first name was derived (*Edayathu*: between two rivers; *Mangalam*: auspicious, goodness). It is near the capital city, Tiruchirappalli (Trichy), of the state of Tamil Nadu. His family is Brahmin, and his father was a distinguished lawyer who practiced in Erode.

Ganesan's secondary schooling was in Trichy, and he achieved a B.Sc. and M.Sc. degree at St. Joseph's College, a Jesuit College then affiliated to Madras University, in 1960. He did his Ph.D. (1960–1965) at the Department of Botany, University of Madras under the supervision of Professor Thamarapu Vedanta Desikachary (1919–2005), a distinguished specialist in phycology. Ganesan worked primarily on the taxonomy of articulate and crustose coralline red algae for his Ph.D.

In true Brahmin fashion, a traditional marriage was arranged with Kalyani on 19<sup>th</sup> January 1961. They had four children: their first son, Bhaskar was born in 1962, a second son, Krupashankar, in 1966, their first daughter, Bhuvana, in 1968 and a second daughter, Uma, in 1969. They all have had successful lives carrying his joy of life and work in India and in the USA.

Ganesan and his wife left India in October 1967 to do what he loved most, research and teaching, joining the Instituto Oceanográfico, Universidad de Oriente, Cumaná, Venezuela from 1967 to 1994 when he retired and returned to Chennai (Madras) in Tamil Nadu. Their sons stayed in Madras, but the two daughters were born in Cumaná.

For a sabbatical leave (1974–75) he came with his family (wife and two daughters) to the Department of Botany, University of California, Berkeley where we did culture studies on *Rhodophysema elegans* (*Rhodophysemataceae*, *Palmariales*) and on the life history and developmental morphology of two *Gloiosiphonia* species (*Gloisphoniaceae*, *Gigartinales*). In 1988, he returned to UC Berkeley for 6 months to complete his catalogue “*Marine Algae of Venezuela*”.

At Cumaná, Ganesan had several students including Andres Lemus, Mirella Aponte-Díaz, V. D'Lacoste, Beatriz Vera Vegas and others. He and his students published 30 papers on marine and freshwater algae of Venezuela. In total, Ganesan published 51 papers with various colleagues globally.

Ganesan and I collected in 1991 many marine and some freshwater red algae around Venezuela that have proven very valuable for ecophysiology, culture life histories and molecular phylogeny. Perhaps the most striking are *Bostrychia moritziana* isolates from the rapidly moving freshwater stream Rio Guaire at about 100 m above sea level. In culture the two isolates have grown and reproduced (males, females, tetrasporophytes) very well at 5 ppt seawater for 30 years. Both are in a VZ molecular genome (26S rRNA and *rbcL* DNA) different from all other strains in the *B. radicans/moritziana* complex.

After 28 years at Universidad de Oriente, he retired in 1994 and returned to Chennai and lived with his wife Kalyani in an apartment complex. We continued our research activities in India collecting in mangrove habitats of Tamil Nadu for red algae (*Caloglossa* and *Bostrychia*), collecting freshwater reds in Kerala, Uttar Pradesh, Manipur, Nepal and Assam 2018, attended several conferences in Chennai, Tamil Nadu (three times), Kerala (twice), West Bengal (twice) (Visva-Bharati University, November 2013, University of Calcutta, December 2016). In February 2018, Ganesan organized a successful field trip to north-eastern India and eastern Nepal with the participation of Orlando Necchi Jr. (Brazil) and me, where we did taxonomic investigations on various Batrachospermals with another Indian colleague, Farishta Yasmin (Nowgong College, Assam) and a Nepalese colleague, Shiva Kumar Rai (Tribhuvan University, Nepal).

Our collaboration and publication with Indian, Nepali and Japanese colleagues of many specimens from the whole freshwater region of the Indian subcontinent, especially NE India and Nepal, have proven the rich biodiversity in the Batrachospermals. Orlando Necchi's skills in molecular methods have proven essential in all this. Ganesan had a special skill in approaching colleagues, particularly Indian and Nepalese, to start new collaborations, which have been essential in the study of freshwater and resulted in several publications. He recognized the lack of molecular investigations in the whole region and encouraged Necchi and me to contribute to the whole enterprise. His early death from COVID on the 6<sup>th</sup> of May 2021 will make it most difficult to continue our work but his cheerful spirit will always encourage us.

Ganesan was very helpful and supportive to AlgaeBase and *Notulae Algarum*, in particular providing advice, books, reprints and scans of scarce Indian algal literature.

He represents a loss to everyone in phycology worldwide.

Publications of E.K. Ganesan (alphabetically by first author)

Albornoz, O. & Ganesan, E.K. (1994). Marine macroalgae of Falcón State, Venezuela - 2: two new additions of Rhodophyta for Venezuela. *Boletín del Centro de Investigaciones Biológicas* 28(1): 19-32.

- Aponte Diaz, M. & Ganesan, E.K. (1990). *Centrocerocolax ubatubensis* (Ceramiaceae, Ceramiales), an adelophoparasitic red alga new to the Caribbean Sea. *Bol. Inst. Oceanogr. (Cumaná)* 29: 5-9.
- Bertossi, A. & Ganesan, E.K. (1973). El genero *Sargassum* C. Agardh (Feofita) en el Oriente de Venezuela. *Lagena* 31: 3-22.
- Changkaew, W., Sakset, A., Chankaew, S., Ganesan, E.K., Necchi, O., Jr & West, J.A. (2019). Diversity of freshwater algae at Khao Luang National Park, southern Thailand. *Algae. An International Journal of Algal Research* 34(1): 23-33.
- D'Lacoste V, L.G. & Ganesan, E. K. (1987). Notes on Venezuelan freshwater algae I. *Nova Hedwigia* 45: 263-281.
- D'Lacoste, L.G. & Ganesan, E.K. (1972). A new freshwater species of *Rhodochorton* (Rhodophyta, Nemaliales) from Venezuela. *Phycologia* 11: 233-238.
- DeCew, T.C., West, J.A. & Ganesan, E.K. (1981). The life history and developmental morphology of two species of *Gloiosiphonia* (Rhodophyta: Cryptonemiales, Gloiosiphoniaceae) from the Pacific coast of North America. *Phycologia* 20: 415-423.
- Desikachary, T.V. & Ganesan, E.K. (1967). Notes on Indian red algae IV. *Hydrolithon reinboldii* (Weber van Bosse et Foslie) Foslie and *Hydrolithon iyengarii* sp. nov. *Phykos* 5: 83-90, 13 figs.
- Ganesan, E.K. (1963). Notes on Indian red algae - II. *Dermatolithon ascripticum* (Foslie) Setchell et Mason. *Phykos* 1: 108-114, 12 figs.
- Ganesan, E.K. (1964). Notes on Indian red algae - III. *Fosliella minutula* (Foslie) comb. nov. *Phykos* 2: 38-44, 9 figs.
- Ganesan, E.K. (1965). Studies on the morphology and reproduction of the articulated corallines - I.. *Phykos* 4: 43-60.
- Ganesan, E.K. (1966). Morphological studies on the genus *Arthrocardia*. *Salt Research and Industry* 3: p. 12 (Abstract).
- Ganesan, E.K. (1966). Studies on the morphology and reproduction of the articulated corallines - I. *Phykos* 4: 43-60, 30 figs, 1 plate.
- Ganesan, E.K. (1967). *Morphological studies on the genus Arthrocardia Decaisne Emend.* Areschoug. pp. 159-168, 13 figs, 1 plate. Bhavnagar, India: Central Salt& Marine Chemicals Research Institute.
- Ganesan, E.K. (1968). Studies on the marine algal flora of Venezuela 1. - The occurrence of the brown alga *Levrtingia brasiliensis* (Montagne) Joly in the Caribbean. *Boletín del Instituto Oceanográfico, Universidad de Oriente* 7: 129-136.
- Ganesan, E.K. (1968). Studies on the morphology and reproduction of the articulated corallines - II. Corallina Linnaeus emend. Lamouroux. *Boletín del Instituto Oceanográfico, Universidad de Oriente* 7: 65-97.
- Ganesan, E.K. (1968). Studies on the morphology and reproduction of the articulated corallines - III. *Amphiroa* Lamouroux emend. Weber van Bosse. *Phykos* 6: 7-28, 39 figs, 1 plate.
- Ganesan, E.K. (1968). Studies on the morphology and reproduction of the articulated corallines - IV. *Serraticardia* (Yendo) Silva, *Calliarthron* Manza and *Bossiella* Silva. *Botanica Marina* 11: 10-30.
- Ganesan, E.K. (1970). Studies on the marine algal flora of Venezuela II. Two interesting new additions. *Boletín del Instituto Oceanográfico, Universidad de Oriente* 9: 103-108.
- Ganesan, E.K. (1971). *Amphiroa currae* (Corallinaceae), a new species of marine algae from Venezuela. *Phycologia* 10: 155-161.
- Ganesan, E.K. (1971). Studies on the morphologie [sic] and reproduction of the articulated Corallinales - VI. *Metagoniolithon* Weber van Bosse. *Revue Algologique, Nouvelle Serie* 10: 248-256, 12 figs, pl. 21.

- Ganesan, E.K. (1973). A new species of *Gelidiocolax* Gardner (Choreocolacaceae, Rhodophyta) from the Caribbean Sea. *Boletín del Instituto Oceanográfico, Universidad de Oriente* 9: 93-102, 18 figs, 1 map, 1 folded synopsis.
- Ganesan, E.K. (1974). Studies on the marine algal flora of Venezuela V. *Pseudogloioiphloea halliae*. *Journal of Phycology* 10: 415-418.
- Ganesan, E.K. (1975). Studies on the marine algal flora of Venezuela VI. *Cryptonemia delicatula* subsp. *venezuelensis* subsp. nov. (Rhodophyta, Cryptonemiales). *Phycologia* 14: 139-143.
- Ganesan, E.K. (1976). On *Kallymenia westii* sp. nov. (Rhodophyta, Cryptonemiales) from the Caribbean Sea. *Boletín del Instituto Oceanográfico, Universidad de Oriente* 15: 169-175, 21 figs.
- Ganesan, E. K. (1981). Morphological studies on *Agardhiella* Schmitz (Gigartinales, Rhodophyta) from Venezuela. *Proceedings of the International Seaweed Symposium* 10: 175-180.
- Ganesan, E.K. (1983). Evaluacion de la flora macrobentonica (macroalgas y fanerogamas marinas) de la Cuenca Tuy-Cariaco, Venezuela. *Boletín del Instituto Oceanográfico, Universidad de Oriente (Cumaná)* 22: 145-175.
- Ganesan, E.K. (1990). *A catalog of benthic marine algae and seagrasses of Venezuela*. pp. [1]-237, 15 maps. Caracas: Fondo Editorial Conicit.
- Ganesan, E.K. (1992). Taxonomy of the economically important seaweeds of Venezuela. *Gracilaria: G. lacinulata* (Vahl) Howe prox. *Boletín del Instituto Oceanográfico, Universidad de Oriente (Cumaná)* 28: 85-97.
- Ganesan, E. K. (1993). Morphological and taxonomic studies on some little-known species of *Gracilaria* (Gracilariales : Rhodophyta) from Venezuela. 1. *G. damaecornis*. *Proceedings of the International Seaweed Symposium* 14: 91-96.
- Ganesan, E.K. (1994). Morphology and taxonomy of the little-known species *Gracilaria cuneata* J.E. Areschoug (Gracilariales: Rhodophyta) from Venezuela. *Caribbean J. Sci.* 30: 124-129.
- Ganesan, E.K., de Albornoz, O., Aponte, M. & González, A. (1985). Studies on the marine algal flora of Venezuela VIII. 4 new additions. *Boletín del Instituto Oceanográfico, Universidad de Oriente (Cumaná)* 24: 237-246.
- Ganesan, E.K. & Desikachary, T.V. (1970). Studies on the morphology and reproduction of the articulated corallines - V. *Lithothrix* Gray. *Phykos* 9: 41-51.
- Ganesan, E.K. & Lemus, A.J. (1972). Studies on the marine algal flora of Venezuela IV. *Botryocladia papenfussiana* sp. nov. (Rhodophyceae, Rhodymeniales). *Phycologia* 11: 25-31.
- Ganesan, E.K. & West, J.A. (1975). Culture studies on the marine red alga *Rhodophysema elegans* (Cryptonemiales, Peysonneliaceae). *Phycologia* 14: 161-166.
- Ganesan, E.K. & West, J.A. (2013). Nomenclatural changes for some freshwater red algae from India. *Algae. An International Journal of Algal Research* 28(1): 45-51.
- Ganesan, E.K. & West, J.A. (1975) Culture studies on the marine red alga *Rhodophysema elegans* (Cryptonemiales, Peysonneliaceae). *Phycologia* 14: 161-166.
- Ganesan, E.K. & West, J.A. (2013). Nomenclatural changes for some freshwater red algae from India. *Algae. An International Journal of Algal Research* 28: 45-51.
- Ganesan, E.K. & West, J.A. (2013). On the identity of an edible macroscopic freshwater (riverine) red alga from Manipur, North-east India. National Conference on “Frontiers in Algology and algal biotechnology” [NCFAAB], Visva-Bharati Univ., Santiniketan, W. Bengal, Programme 15<sup>th</sup> to 17<sup>th</sup> November 2013, p. 6 (abstract).
- Ganesan, E.K., West, J.A. & Necchi, O., Jr. (2018). A catalogue and bibliography of non-marine (freshwater and estuarine) Rhodophyta (red algae) of India. *Phytotaxa* 364(1): 1-48, 2 figs. ISSN 1179-3163 (online edition).
- Ganesan, E.K., West, J.A., Zuccarello, G.C., Loiseaux de Goér, S. & Rout, J. (2015). *Lemanea manipurensis* sp. nov. (Batrachospermales), a freshwater red algal species from North-East India. *Algae. An International Journal of Algal Research* 30(1): 1-13.

- Kamiya, E.K., West, J.A., Karsten, U & Ganesan, E.K. (2016). Molecular and morphological delineation of *Caloglossa beccarii* and related species (Delesseriaceae, Rhodophyta). *Phycologia* 55(6): 640-649.
- Karsten, U., West, J.A. & Ganesan, E.K. (1993). Comparative physiological ecology of *Bostrychia moritziana* (Ceramiales, Rhodophyta) from freshwater and marine habitats. *Phycologia* 32: 401-409.
- Lemus, A.J. & Ganesan, E.K. (1977). Morphological and culture studies in two species of *Predaea* G. De Toni (Rhodophyta, Gymnophlaeaceae) from the Caribbean Sea. *Boletín del Instituto Oceanográfico, Universidad de Oriente* 16: 63-77.
- Necchi, O., Jr., Paiano, M.O., West, J.A., Ganesan, E.K. & Loiseaux-de Goér, S. (2015). *Thorea indica* sp. nov. (Thoreales, Rhodophyta) from Uttar Pradesh, India. *Algae. An International Journal of Algal Research* 30(4): 265-274.
- Necchi, O. Jr., West, J. A., Ganesan, E. K., Yasmin, F. & Rai, S. K. 2019. Diversity of the genus *Sheathia* (Batrachospermales, Rhodophyta) in northeast India and east Nepal. *Algae* 34: 277-288.
- Necchi, O., Jr., West, J.A., Ganesan, E.K., Yasmin, F., Rai, S.K. & Rossignolo, N.L. (2019). Diversity of the genus *Sheathia* (Batrachospermales, Rhodophyta) in northeast India and east Nepal. *Algae. An International Journal of Algal Research* 34(4): 277-288.
- Necchi, O., Jr., West, J.A., Rai, S.K., Ganesan, E.K., Rossignolo, N.L. & Goér, S.L. (2016). Phylogeny and morphology of the freshwater red alga *Nemalionopsis shawii* (Rhodophyta, Thoreales) from Nepal. *Phycological Research* 64: 11-18, 17 figs.
- Rojas, J.J., Lemus, A. & Ganesan, E.K. (1982). El ciclo vital "in vitro" del alga marina roja *Asparagopsis taxiformis* (Delile) Collins & Hervey (Bonnemaisoniales, Rhodophyta) del Mar Caribe. *Bol. Inst. Oceanogr. (Cumaná)* 21: 101-112.
- Rossignolo, N.L., Yasmin, F., West, J.A., Ganesan, E.K. & Necchi, O., Jr. (2020). Molecular and morphological evidence for a new species in the genus *Sidorotia* (Batrachospermales, Rhodophyta) for the State of Assam, India. *Phytotaxa* 437(3): 121-134, 3 figs, 2 tables.
- Rossignolo, N.L., Vis, M.L., Paiano, M.O., Eloranta, P., Lee, J., West, J.A., Ganesan, E.K., Yasmin, F., Lim, P-E & Necchi Jr., O. 2021. Revision of the genus *Sirodotia* (Batrachospermales, Rhodophyta) with description of four new species. *Cryptogamie Algologie* (sous presse).
- Suto, Y., Ganesan, E.K. & West, J.A. (2014). Comparative observations on *Cephaleuros parasiticus* and *C. virescens* (Trentepohliaceae, Chlorophyta) from India. *Algae. An International Journal of Algal Research* 29(2): 121-126.
- Velasquez, C.A.R., Ganesan, E.K. & Bonilla, R.J. (1988). Field and laboratory studies on the agarophyte *Pterocladia capillacea* (S.G. Gmelin) Bornet (Gelidiaceae, Rhodophyta) from Venezuela. *Boletín del Instituto Oceanográfico, Universidad de Oriente* 27(1&2): 3-24.
- West, J.A., Ganesan, E.K., Kamiya, M. & Jose, L. (2014). *Caloglossa*, a beautiful flat-bladed red alga common in marine, estuarine and freshwater habitats. Proceedings of a National Seminar on Taxonomy and Ecology of Freshwater algae (UGC sponsored). Publ. Bot. Dept. St. Albert's College Ernakulam, Kerala: 1-5.
- West, J.A., Kamiya, M., Ganesan, E.K., Loiseaux-de Goér, S. & Jose, L. (2015). *Caloglossa beccarii* (Delesseriaceae, Rhodophyta) from freshwater rivers in Kerala, India, a critical new record. *Algae. An International Journal of Algal Research* 30(3): 207-216.
- West, J.A., Zuccarello, G.C., Ganesan, E.K. & Loiseaux de Goér, S. (2015). Investigations into *Iyengaria*, a poorly known genus of the Scytoniphonaceae (Phaeophyceae) and description of a new species *Iyengaria quadriseriata*. *Phykos* 45(2): 43-50, 3 figs.