

An Early 18th Century Account of Marine Algae from the Philippines

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This paper deals with an early documented account of a putative species of a marine alga called “Gosó” that was common in Luzon and Cebu islands. The paper was published in 1704 and found among an obscurely known compilation of Philippine *materia medica*. The same account also provides evidence for the extensive exploitation of seaweeds and other marine products for commerce in the Philippines in 16th and 17th centuries.

Key Words: marine algae, Philippine phycology, Georg Joseph Kamel, *Materia Medica*

INTRODUCTION

The historical starting point for botanical studies in the Philippines has traditionally been attributed to the Augustinian monk, Father Francisco Manuel Blanco, O.S.A. (1778-1845), whose seminal work “Flora de Filipinas,” was published for the first time in 1837. The same work was subsequently edited and published posthumously in 1845 and reissued in an illustrated edition between 1877 and 1883. Recently, this traditional Blanco publication date has been found to be antedated by an earlier starting point of Philippine botany attributed to the lesser known work of the Manila-based Jesuit missionary, Georg Joseph Kamel, S.J. (1661-1706), who had studied Philippine *materia medica* and maintained correspondence with some of Europe’s prominent botanists and naturalists throughout his decades-long stay in colonial Philippines (Reyes 2009).

The history of phycology in the Philippines has somewhat ran parallel with that of higher plant taxonomy. Every historical account of Philippine phycology published thus far pointed to the publication of Father Blanco’s “Flora de Filipinas” in 1837 as the birth of Philippine phycology as a science (e.g., Cordero 1972, Velasquez et al. 1975,

Velasquez 1985, Silva et al. 1987, Ganzon-Fortes 2012). In this pioneering treatise on Philippine botany which predominantly and mainly focused on local phanerogams, Blanco included a few species of marine algae collected from the vicinity of Manila comprising some of the earliest known seaweed collections from the country. These were named by Blanco himself albeit inaccurately, and he recognized them under the few Linnaean algal generic names available at that time (e.g., *Ulva*, *Fucus*, *Conferva*). Because Blanco did not make voucher specimens, or more probably, his herbarium cannot be located, Merrill (1918) lectotypified most of the names published in “Flora de Filipinas” including those identified as marine algae.

During a routine archival research at the Rare Books Collection of Louis Round Wilson Library of the University of North Carolina at Chapel Hill, the author came across a rare botanical work of the British botanist John Ray (1627-1706), considered to be the Father of British natural history --- the third volume of his landmark “*Historia generalis plantarum*” published in 1704 (Figure 1). To recall, John Ray was one of the prominent naturalists in Europe [the other being the English botanist James Petiver (ca.1665-1718)] with whom Kamel had corresponded and sent manuscripts and specimens to. The intricate circumstances surrounding the long association

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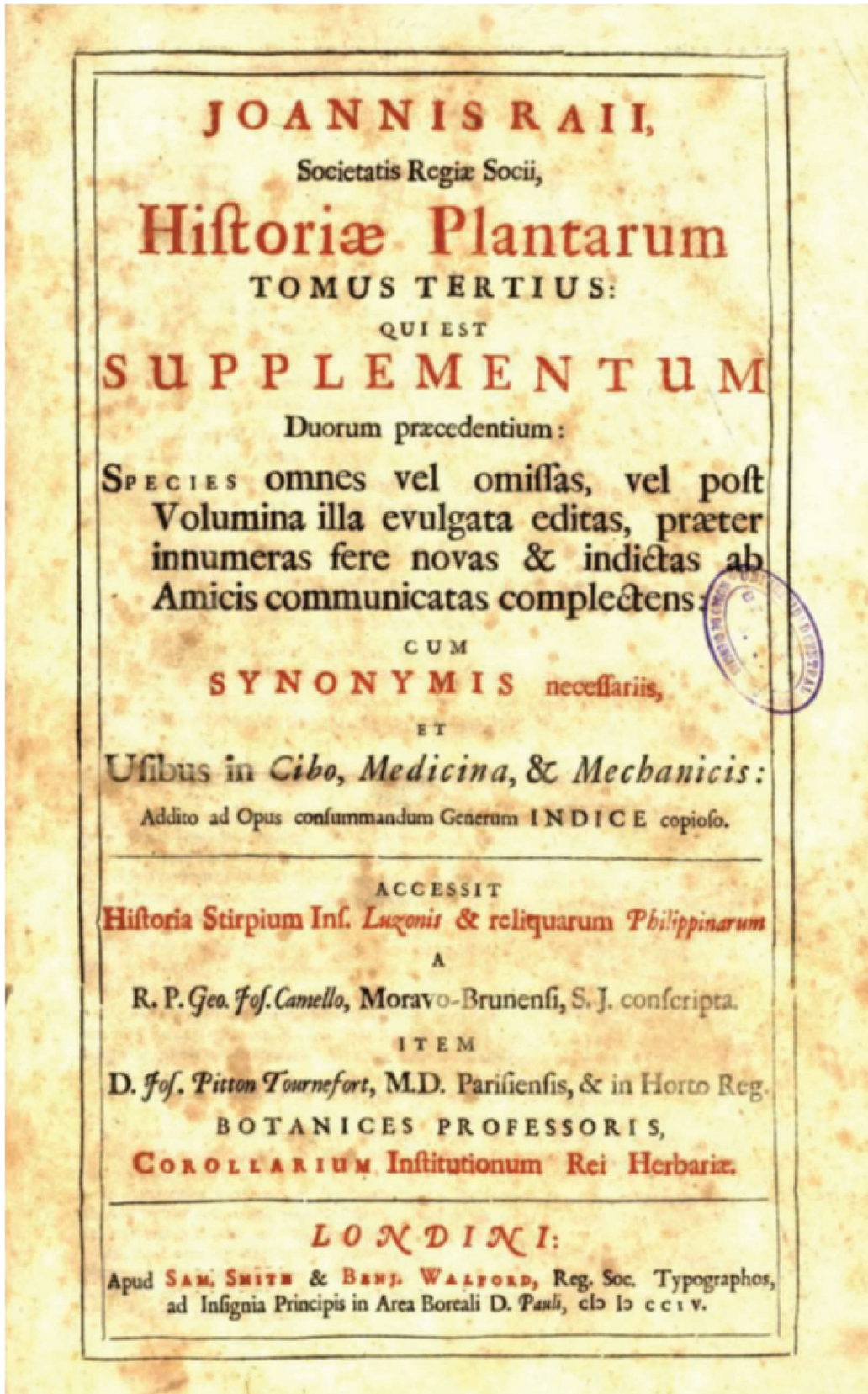


Figure 1. Cover page of the *Historia Plantarum*, volume three, published by John Ray in 1704. Notice the information on Georg Joseph Camel's important contribution appended to this work on the lower half of the cover page (image courtesy of the digital library of the Real Jardín Botánico Madrid).

between the two naturalists (i.e., Ray and Kamel), separated halfway around the world, have been outlined in the fine biographical accounts written by Cullum (1956) and Reyes (2009).

In that particular final volume of “*Historia generalis plantarum*”, Ray published a poorly known manuscript from Kamel as an appendix, apparently in a hurried manner to accommodate and reciprocate his Manila-based correspondent. This was entitled “*Herbarium aliarumque stirpium in Insula Luzone Philippinarum*” minus the botanical illustrations that apparently were sent along with the manuscript, the disposition of which is not clearly known (Figure 2). This 1704 compendium of local medicinal plants and herbs compiled by the colonial pioneer pharmacist in Manila, G.J. Kamel, in the course of his humanitarian service can therefore be considered to be the starting point of Philippine plant taxonomy history, although some would argue about Kamel’s contribution as being short of the strict definition of a science, specifically in plant taxonomy that is traditionally based on the Linnaean system.

Among the Philippine medicinal plants listed in this work, there is an interesting entry on page 42 of the appended work, to wit:

“12. *Corallina edulis Gosò mollis est, & tenera, coloris candidi, aut flavescens. Sinis Haysom dicitur, qui eam ex Luzone Chinam deserunt, & ut cardiacam deprædicant. Abundat in Insula Zebu.*”

This interesting account deserves some comment and explanation which shall be attempted below. The particular entry was found towards the end of the long list of medicinal plants and herbs compiled by Kamel. Arguably, this seemingly odd item numbered 12 in the compilation listed a miscellany of medicinal materials that are neither plants nor herbs in the strict sense as we know them today, i.e., vascular plants. “Gosò” is a Philippine Bisayan term used to this day to refer to the vernacular name of a group of edible red seaweeds harvested from the wild belonging mainly to the Solieriaceae. In the Philippines, this family is represented by a number of wild and cultivated species classified under the genera *Eucheuma*, *Kappaphycus*, *Betaphycus* and *Solieria* (Silva et al. 1987; Doty 1995; Tito and Liao 2000). Their inter-generic taxonomic distinction is largely based on the chemical nature and type of carrageenan they produce within their cell walls, besides some gross morphological characters which may be variable and showing phenotypic plasticity. Carrageenan is a naturally occurring polysaccharide with a wide array of commercial applications as food additive and is the backbone of a multi-million dollar global industry. All species known and recognized under

these carrageenan-bearing genera are commonly known by the local name “gosò” over a vast area in the southern Philippines where they are extensively cultivated to this day. Apparently, Kamel only came across dried materials of “gosò” as he described them as supple, tender, white and yellowish (‘*mollis... tenera, coloris candidi, aut flavescens*’) in a bleached condition. Living materials are however gelatinous to cartilaginous, heavily pigmented, at times ranging from light purple, crimson and golden to color mutants of green and brown.

Kamel mentioned “*Corallina edulis*” at the start of this particular interesting entry. At first glance, the term looks like a Latin binomial following the nomenclatural concept first proposed by Linnaeus. But the officially designated starting point of binomial nomenclature as applied to plants in the broad sense would not take effect 49 years later with the publication of Linnaeus’ “*Species plantarum*” in 1753. Hence the “*Corallina edulis*” of Kamel, being a pre-Linnaean name, cannot be accepted as a legitimate and valid scientific name following the rules of the International Code for Nomenclature of Algae, Fungi and Plants (2012). In fact, this particular binomial does not seem to exist, nor has it been proposed at least in the phycological taxonomic literature. At best, Kamel’s entry is only meant to be descriptive in nature and which can roughly be interpreted as referring to an organism that is “edible and coral-like,” apparently referring to the bushy, coral-like habit of many species belonging to this seaweed group. It will be recalled too that the early concept of both soft, ahermatypic corals as well as reef-building scleractinian corals (i.e., present-day Cnidaria, Anthozoa) used during the 17th century was confused with terms such as zoophytes which have been applied to both corals and some marine algae (i.e., calcareous species of the Corallinaceae and Halimedaceae). *Corallina* Linnaeus is today an accepted genus of calcareous red marine algae first proposed by Linnaeus (1758) in another work that came soon after his monumental “*Species plantarum*.”

The same entry listed by Kamel mentioned “*Sinis Haysom dicitur*” and this undoubtedly refers to a group of edible species of sea cucumber (Echinodermata, Holothuroidea) abundant in the olden days in Philippine waters, specifically in Luzon per Kamel’s account. Better known throughout the business world in historical and modern times by its Malay name ‘trepang’, or its French name ‘beche-de-mer,’ Kamel documented this apparently medicinally important marine organism under its Chinese name. The name “haysom” [literal meaning: sea ginseng] is derived from the Hokkien or Amoy Chinese dialect for this highly-prized exotic delicacy and aphrodisiac – the aforementioned dialect being the native tongue of the majority of early Chinese merchants in the Philippines who originated from

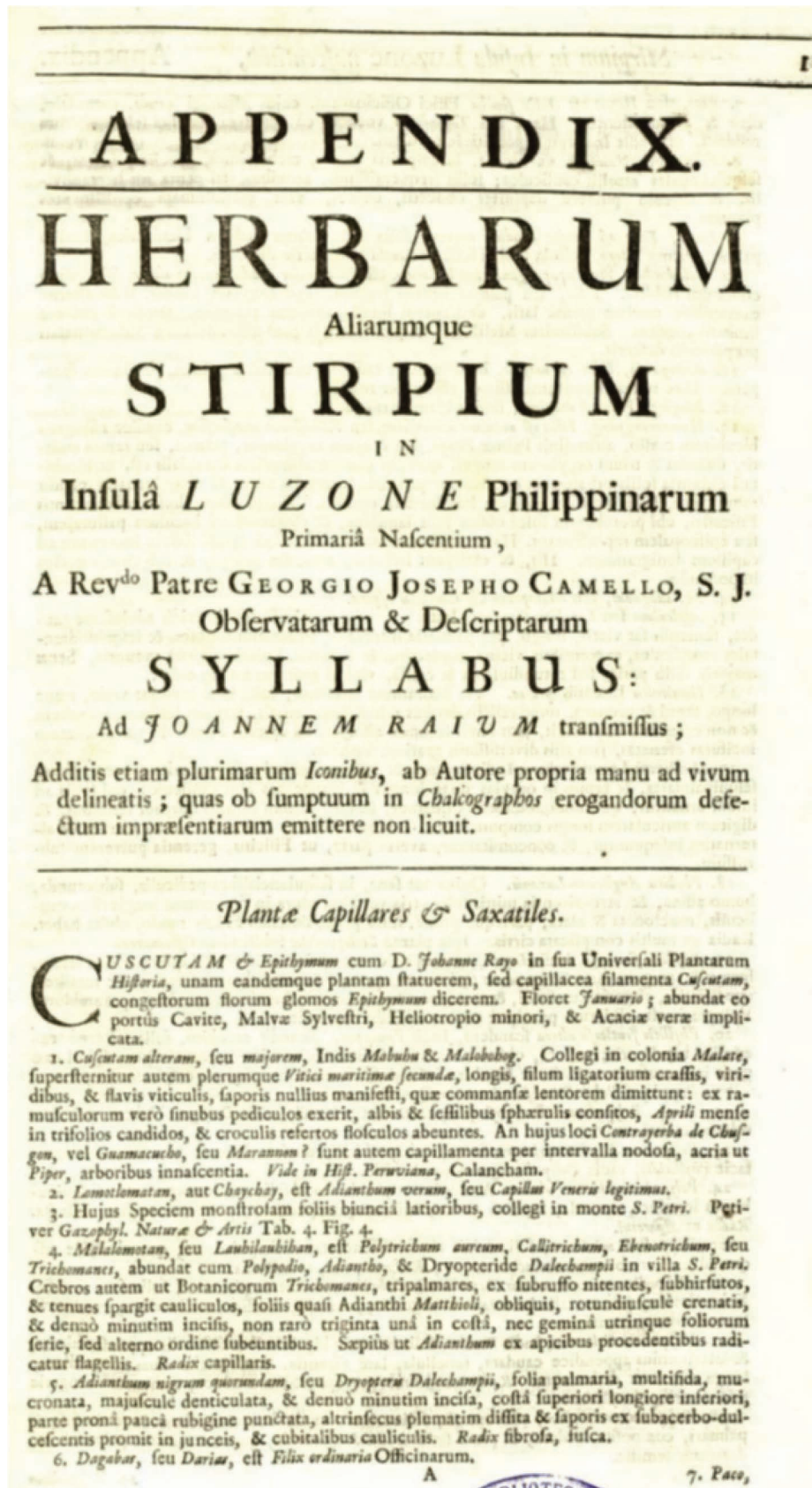


Figure 2. First page of Georg Joseph Camel's botanical compendium appended in the Historia Plantarum (1704) of John Ray (image courtesy of the digital library of the Real Jardín Botánico Madrid).

southeastern Fujian province in mainland China. Many of these merchants have come to settle permanently in the Philippines and other countries around Southeast Asia and comprised the ancestral roots of most overseas Chinese of the region. Sea cucumbers, according to this account of Kamel, were gathered in the waters around Luzon and exported to China as one of the major items of commerce at that time. Together with pearls, dried seaweeds, sharks' fins, tortoise shells and birds' nests, the sea cucumbers in dried form are among the most sought after items of maritime commerce in Southeast Asia since the 14th century (Warren 1981). Kamel also noted that sea cucumbers and/or dried seaweeds were used to treat gastric illnesses ('cardiacam depraedicant') and that these are likewise plentiful in Cebu Island ('abundant in Insula Zebu'), although in the cited account Kamel was not explicit about whether it is the seaweed, the sea cucumber or both that are abundant in Cebu Island. The exact information is not crucial as both marine organisms are equally abundant in both localities and elsewhere around the Philippine archipelago.

This brief account of a marine alga from the Philippines dating back from the early 18th century is historically significant as it antedates the widely accepted pioneering works of Blanco by more than a century. It also highlights the contribution of non-Hispanic naturalists like Kamel who was a native of Moravia (now part of eastern Czech Republic), and who was a long-time resident of Manila as opposed to many other foreigners who conduct botanical exploration and documentation on a transient basis. Some people may argue that Kamel's effort at publishing may not constitute a formal taxonomic contribution *per se* as the established and recognized starting point in botanical nomenclature was not set until 49 years later by the grand opus of Linnaeus (1753). It is not far-fetched to speculate that Kamel only had a pharmacopoeic purpose in mind and as such, his work constitutes a valuable contribution to the preservation of indigenous medicinal knowledge gleaned from the earlier days of Philippine colonial history.

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REFERENCES

- CORDERO PA Jr. 1972. Philippine algology: Its beginnings and development. *Leyte-Samar Studies* 6: 16-47.
- CULLUM LA. 1956. Georg Joseph Kamel: Philippine botanist, physician, pharmacist. *Philippine Studies* 4: 319-339.
- DOTY MS. 1995. *Betaphycus philippinensis*, *gen. et sp. nov.* and related species (Solieriaceae, Gigartinales). In: *Taxonomy of economic seaweeds* (I.A. Abbott, ed.), vol. 5, pp. 237-245. California Sea Grant College Program.
- GANZON-FORTES ET. 2012. A historical account of biodiversity studies of Philippine seaweeds (1800-1999). *Coastal Marine Science* 35: 182-201.
- LINNAEUS C. 1753. *Species plantarum*, 2 volumes. Holmia [Stockholm].
- LINNAEUS C. 1758. *Systema naturae per regna tria naturae*, edition decima, volume 1. Holmia [Stockholm].
- MERRILL ED. 1918. *Species Blancoanae: A critical revision of the Philippine plants described by Blanco and by Llanos*. Manila.
- REYES RAG. 2009. Botany and zoology in the late seventeenth-century Philippines: the work of Georg Josef Camel, S.J. (1661-1706). *Archives of Natural History* 36: 262-276.
- SILVA PC, MEÑEZ EG., MOE RL. 1987. Catalog of the benthic marine algae of the Philippines. *Smithsonian Contributions to Marine Sciences* 27: 1-197.
- TITO OD, LIAO LM. 2000. Ethnobotany of *Solieria robusta* (Rhodophyta, Gigartinales) in Zamboanga, Philippines. *Science Diliman* 12: 75-77.
- VELASQUEZ GT. 1985. History of phycology in the Philippines, part 1. *Philippine Journal of Science* 114: 247-250
- VELASQUEZ GT., Trono, G.C. and Doty, M.S. 1975. Algal species reported from the Philippines. *Philippine Journal of Science* 101: 115-169.
- WARREN JF. 1981. *The Sulu Zone, 1768-1898: The dynamics of external trade, slavery, and ethnicity in the transformation of a Southeast Asian maritime state*. Singapore: Singapore University Press.