

The Nomenclature of the Balsa Tree.

J. S. WOMERSLEY.

Chief of Division of Botany, Department of Forests, Lae.

THE recent collection of seed from the two select balsa trees in the Botanic Garden, Lae, has again drawn attention to the involved nomenclature of balsa. This note reviews the names involved and deals with each in turn. A preferred name *Ochroma lagopus* Swartz is recommended with an alternative *Ochroma pyramidalis* (Cav.) Urban.

The balsa tree has long been known as a wild species of the lowlands of tropical central America and northern South America. The utilization of the wood of the balsa trees brought the genus into prominence during the 1914-1918 war. Balsa was extensively used for refrigeration insulation, buoyancy material in life rafts, etc., and in aeroplanes. During 1918 and 1919 W. W. Rowlee and his son were commissioned to investigate the quantity of balsa timber, the quality thereof and the kinds which grew in the Central American countries of Panama, Costa Rica, Nicaragua and Guatemala.

The supposed taxonomic results of this survey were published by Rowlee (1919) who augmented the then recognized names *O. lagopus* and *O. tomentosa* by no fewer than seven new names. The characters used by Rowlee to distinguish his species are:

- (1) geographical distribution;
- (2) supposed discontinuity of flowering periods; and
- (3) degree of "keeling" on the calyx lobes, the shape of the calyx lobes, degree of pubescence on the leaves, leaf shape.

Pierce (1942a) published a short paper on the nomenclature of balsa and a further paper (1942b) in which he evaluated the type material of Rowlee's species. In summary his findings are:—

1. Using the key published by Rowlee (1919), at least one of his types may be identified with any one of nine species; and
2. That the supposed characters of the calyx lobes, leaf shape and pubescence are onotogenic characters which change with the

maturity of the flowers and the position on the tree from which the flower is taken. Pierce (1942b) also points out that Rowlee is not exact in the use of his terms. In general Rowlee misinterpreted normal variation in the calyx and leaf for specific differences.

Pierce does not discuss Rowlee's segregation of his species on the basis of the month of flowering. On the face of it, this characteristic could be of some taxonomic value. However, there is circumstantial evidence that his observations are incomplete as in Rowlee's works he spent seven months in Panama, Costa Rica, Nicaragua and Guatemala. His field observations would therefore be limited to this period. It is also probable that the onset of maximum flowering in balsa is correlated with the climatic pattern.

Rowlee's species, with their geographic pattern and flowering periods are:—

- O. limonensis* Rowlee. Caribbean coast of Costa Rica and Panama. Flowering May, June, fruiting July and August; lat. 8 degrees—10 degrees north. Limon Balsa.
- O. grandiflora* Rowlee. Ecuador, Pacific coast. Flowering July and August, fruiting September, October; lat. equator—3 degrees South. Ecuador Balsa. (This is the Balsa of the Kon Tiki raft).
- O. velutina* Rowlee. Pacific coast of Costa Rica and Guatemala. Flowering December to February, fruiting February to April. ["That is the dry season where it is found"; Rowlee (1919 p. 165).] Described by Rowlee as a small flowered species at altitudes from sea level to 600 metres. The wood is described as reddish and heavier (I suggest that the small flowers and denser wood are manifestations of altitude and possibly a dry season which is of longer duration than normal.) Latitude 10 degrees—15 degrees north. Red Pacific Coast Balsa.

O. bicolor Rowlee. Costa Rica at altitudes up to 250 metres. Flowering November to December, fruiting January to March. Rowlee states that this species will grow on the volcanic slopes of Turrialba up to 1,000 metres. Latitude 10 degrees north on the north facing slopes of the cordillera. Guapiles Balsa.

O. boliviana Rowlee. North "eastern" Bolivia, not seen alive by Rowlee. Latitude 16 degrees south, east facing slopes of the cordillera. (Rowlee gives the locality as Mapiri which is north-western Bolivia.) Flowering July and August, fruiting August and September. Bolivian Balsa.

O. obtusa Rowlee. Caribbean coast of Colombia. Not seen alive by Rowlee, altitude "500-2,000 feet"; flowering December and January; fruiting in May, latitude 8 degrees south, low altitude.

O. concolor Rowlee. Gulf of Honduras, Guatemala and British Honduras. Flowering December to January, fruiting February, March; latitude 15 degrees north. Apparently a swamp species. Barrios balsa.

Pierce, after examining all Rowlee's material and considerable additional specimens rejected all Rowlee's names.

There are however, four other names to be considered. *O. tomentosa* Willd. was described from material collected by Humboldt, about 1790, in the upper valley of the Magdalena River, Colombia. The species was then separated from *O. lagopus* by the repand leaves. Since then, further collections have shown that dentate leaves may occur in varying degrees throughout the geographical range of balsa. Consequently, the name *O. tomentosa* Willd. cannot be sustained. *O. peruviana* Johnston was preferred by Macbride to *O. boliviana* Rowlee, and Pierce after further examination of Johnston's material rejected the name as of no specific status.

It is now necessary to discuss the two remaining names which have been published in *Ochroma*, both of which have considerable claim to acceptance as the valid name for balsa.

Of these names, *O. lagopus* O. Swartz is the best known. This name was published in Swartz's Prodrumus, the best estimate of the date of publication being 1788, prior to September of that year. In the same year, Cavanilles (1788)

published the name *Bombax pyramidale* in Lamarck's Encyclopaedia (1788) (pt. 2, p. 552) for the same plant as described by Swartz. The title page of Lamarck's Encyclopaedia is dated 1786 but Woodward (1906) and others who have carefully examined the evidence of publication consider that this volume did not appear until April, 1788. Cavanilles (1788b) also validly published *B. pyramidale*, in June, 1788.

The picture then is that the name *lagopus* was published in 1788 some time prior to September while *pyramidale* appeared twice in April and June, 1788. Urban accepting the title page date of Lamarck's Encyclopaedia as correct, made the combination *Ochroma pyramidale* (Cav.) Urb.

J. H. Pierce considered that as the date of publication of Swartz's Prodrumus will probably never be known with certainty, it is perhaps preferable to accept the most widely used name, viz., *O. lagopus* Swartz and reduce *O. pyramidale* (Cav.) Urban to the synonymy of that species. The reverse arrangement could equally well be used but I follow Pierce in suggesting that common usage of *O. lagopus* O. Swartz should justify acceptance of that name.

The accepted name and synonymy is the *Ochroma lagopus* O. Swartz Prodrumus 98, 1788.

Syn.

O. pyramidalis (Cav.) Urban. Fed. Rep. Beib. V.223, 1920.

basonym *Bombax pyramidale* Vac. Lam. Enc. 2, 552, 1788.

O. tomentosa Willd. Enum. Hort. Berol. 695, 1809.

O. concolor Rowlee Journ. Wash. Acad. Sci. 9, 161, 1919.

O. limonensis Rowlee l.c. 163.

O. grandiflora Rowlee l.c. 163.

O. velutina Rowlee l.c. 164.

O. bicolor Rowlee l.c. 165.

O. boliviana Rowlee l.c. 166.

O. obtusa Rowlee l.c. 166.

O. peruviana Johnston Contr. Gray Herb. n.s. LXXXI, 95, 1928.

The problem now remains to provide names for the several strains of *O. lagopus* being grown in Papua and New Guinea. As no varietal names have been validly published, it is recommended that the source of the introduction could provide a working epithet to recognize the more important strains, e.g., "Sarmi" for the select trees from which seed is now being harvested at Lae. The name *pyramidale* is to be regarded as completely interchangeable with *lagopus* and does not represent a distinct species.

The taxonomy of the genus *Ochroma* is undoubtedly in need of further attention which can be done only if supported by extensive field work in the belt of country between latitude 15 degrees north and 15 degrees south in Central America.

REFERENCES.

- CAVANILLES (1788a) *Lam. Enc.* 2,552.
 CAVANILLES (1788b) *Diss. Bot.* 5,294.
 ROWLEE, W. W. Synopsis of the genus *Ochroma* with descriptions of new species. *Journ. Wash. Acad. Sci.* Vol. 9, pt. 6, 1919, pp. 157-167.
 PIERCE, JOHN H. The nomenclature of Balsa wood (*Ochroma*). *Tropical Woods.* No. 69, March 1, 1942. pp. 1-2.
 PIERCE, JOHN H. An evaluation of the type of material of *Ochroma*, the source of balsa wood. *Tropical Woods.* No. 70, June 1, 1942. pp. 20-23.
 MACBRIDE, J. FRANCIS. Identity of the Peruvian Balsa. *Tropical Woods.* No. 17, March 1, 1929, pp. 5-7.
 WOODWARD, B. B. [Dates of Publication of Lamarck's "Encyclopedie Methodique" (Botany)] *Journal of Botany, British and Foreign.* Vol. 44, 1906, pp. 318-320.
 URBAN. Plumiers leban und Schriften nebst einem. Schlüssel zu seinen. *Fed. Rep. Beib. Blütenflangen* (1920) 5, 123.