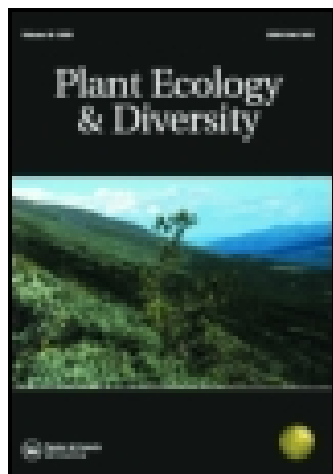


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NOTE ON *ARAUCARIA BIDWILLII*, HOOK.

By Professor GIOVANNI ARCANGELI.

I believe it will be of interest to call attention again to a specimen of this species growing in the Botanic Garden of Pisa.¹ This specimen, obtained from the nursery of M. Scarlatti at Florence, was planted in the place named Orto Nuovo by the late Professor T. Caruel in 1872. This plant, when transferred to our Botanic Garden, probably was not more than twelve years old, and will now be fifty-three years old. Though the stem of this plant was three times cut off near the top by wind, it has always restored its summit quite well, and now its habit is very imposing, and resembles that of an *Abies*, the stem being clothed by branches disposed in numerous whorls from the base to the top. At the time of my former publication, the stem of this plant was 12 m. high and 0.35 m. in diameter; at present it attains a height of 16 m., and a diameter at the base of 0.54 m., growing in thirteen years about 4 m. in length and 0.19 m. in thickness. It thus becomes clear that the ground of our garden is very suitable for the cultivation of this plant, which not only grew vigorously, but supported the heat and dryness of the summer, as well as the cold of the winter, down to -8° C.

In the year 1911, we began to observe on our plant, in the spring, some flowers, probably born in the preceding year. The flowers appeared on the branches near the top of the tree, and were amentiform, in small quantity, and female, bearing ovules but without stamens. Therefore we infer that this plant has attained its puberty about its fifty-second year. At the end of September the flowers were changed into bulky cones nearly 25 cm. long and 15 cm. broad. Each cone was composed of the superior part of a branch, swollen and oblong, bearing numerous appendages, which on maturity fell down with the seeds included within. These appendages have a complex nature, which is not easy to explain. Each appendage is formed by a cone-scale, placed in the axil of a bract, but almost completely adnate

¹ "Bullettino della Società botanica italiana," Nov.-Dic. 1899, N. 9-10, p. 262.

to it, and variously judged by morphologists. R. Brown held that the cone-scale was formed by two open carpellary leaves or ovuliferous leaves, while by other authors (A. Braun, etc.) it was interpreted as a placental protuberance of the bract bearing the ovules. Professor Parlatore and others explained the cone-scale as a floral branch born in the axil of the bract. Professor Delpino held that the cone-scale was an ovuliferous member formed by coalescence of the two margins of the bract, according to his theory on Antispermia. In a short note presented to the Botanical Congress at Paris in 1878, I expressed the opinion that the cone-scale of Coniferales¹ would be a member intermediate between the branch and the leaf, which I named Cladophyllum, corresponding to the Cladodium of Kunth. The cone-scale had been also called Synphyllodium² by Celakovsky, but this name seems to me not suitable, because the term Phyllodium is appropriated to the case of a petiole imitating the blade of a leaf, and the cone-scale is not formed by stalks of leaves only, but also by a part of an axis or branch. Some of these cone-scales in our plant presented a seed in the middle part, but these seeds, though furnished with a hard and woody shell surrounding a reddish tissue, were without embryo or empty. As we have not in our garden a male specimen, it was not possible to obtain seeds with embryos and capable of reproduction.

It is interesting to remark that near this female specimen grows a male plant of *Araucaria brasiliiana*, A. Rich., more than forty years old, which flowers every year, but the sterility of the seeds obtained would show that the pollen of that plant is not able to fertilise our *A. Bidwillii* and produce a hybrid; however, it is not prudent to judge by a single case in so difficult a question. As this pollen was perfectly developed and fertilised the female flowers of another specimen of *A. brasiliiana* placed at a little distance, with production of numerous progeny,

¹ "Congrès intern. de Botanique tenu à Paris," 16-24 août 1878, Paris, 1880, p. 38.

² Celakovsky, L. J., "Neue Beiträge zum Verständniss der Fruchtschuppe der Coniferen" ("Jahr. für wiss. Botanik, begr. von Professor N. Pringsheim," xxxv., Leipzig, 1900, pp. 407-448).

we must infer that the failure is not due to a bad structure or disease of the pollen.

M. B. Chabaud, in a publication of 1882,¹ mentions a specimen of *A. Bidwillii* growing in the garden of the Duke of Vallambrosa at Cannes. The stem of this specimen had reached a height of 12 m. and a diameter of 0.50 m. This plant bore fruits in that year, but these were sterile.

In the same year, 1882, a female specimen of this species flowered in the Botanic Garden of Naples. We keep in our collection some cone-scales of this plant, but with sterile seeds.

Specimens of this species were subsequently observed to be fruitful in 1884 at Palermo, at the villa of the Prince of Trabia and Butera,² and about this time also in South France and Algeria.³

The fruiting of another specimen of this species was announced by Professor C. Naudin in the garden of the Villa Thuret at Antibes in 1893, but here also the seeds were sterile.⁴

In the Botanic Garden of Palermo this plant grows perfectly and bears fecund fruits, which, according to Professor Borzi,⁵ ripen in fifteen months. Another plant of this species is growing in the Botanic Garden of Catania in Sicily. This specimen is monoecious and able to bear fecund seeds, as appears from the "Index plantarum quas Hortus bot. R. Universitatis catinensis pro mutua commutatione offert, 1898," where the fecund seeds of this plant are quoted.

The seeds of this species are also offered in the "Index seminum Horti botanici Universitatis olisiponensis anno 1911 collectorum" (p. 29), and I have asked for them, but I have received only a sample with the kernel completely perished and quite unable to germinate.

¹ Morren, Ed., "La Belgique horticole," 1882, p. 213.

² "Bull. della Società toscana di Orticoltura," 2^a ser., vol. i., 1886, p. 241.

³ Heckel, E., "Sur le Bunya-bunya (*A. Bidwillii*, Hook.), et son acclimatation en Algérie," etc. ("Revue Sc. nat. appl.," 1891, 2 sér., 38 année, Paris, pp. 280-295).

⁴ "Bull. della Società toscana di Orticoltura," 2^a ser., vol. viii., p. 316.

⁵ Borzi, A., "Biologia della germinazione dell' *A. Bidwillii*, Hook." ("Contr. Biol. veg.," iii., 1895, pp. 355-373, tav. xvi.).

Some specimens of this species are also growing at Rome, near the railway station, in the Garden of Pincio, at Villa Doria Pamphily, and elsewhere. The specimens near the railway station are 19 m. high and 0.61 m. in diameter at the base; likewise, a splendid specimen cultivated at Villa Pamphily last year was fruitful, but with sterile seeds. Evidently the dioecious nature of this species is the cause of its frequent sterility, and the parthenocarpous condition of its fruits.

Meanwhile, as it would be very interesting to settle for this species the possibility of cross fertilisation with *A. brasiliiana*, in the last spring we have dusted the branches of the upper part of our specimen with the pollen of *A. brasiliiana* above mentioned, appending also the floriferous branches of this specimen to the branches of the other, for facilitating the crossing between the two species, and now we are waiting the upshot of this experiment.

Moreover, we suggest that it would be very profitable to promote the culture of this species in Italy and in other temperate climates, not only as an ornamental plant for its persistent and pretty foliage, but also for the products which it may supply (timber, seeds, etc.).

A NEW PLEUROSPERMUM. By W. G. CRAIB, M.A.,
and W. W. SMITH, M.A.

Pleurospermum amabile, Craib et W. W. Sm. Sp. nov.

Species affinis *Pleurospermo densifloro*, Benth. et *P. Brunonis*, Benth.; foliis floribusque persimilis, bracteis obovatis vel suborbicularibus permagnis cum foliis imbricatis pulcherrime purpureo-suffusis distinguenda.

Planta erecta 8–20 cm. alta, radice crassâ prædita, basi ad collum vaginis foliorum marcidorum induta. Folia basalia 1–2, vaginâ 3–6 cm. longa, petiolo 1–2 cm. longo vel nullo prædita; lamina ambitu ovata, 3–4-pinnata, glabra, ad 5 cm. longa, segmentis ultimis setaceis 1–2 mm. longis; folia caulina plura basalibus subsimilia, laxè imbricata, vaginâ circ. 3 cm. longâ, fere orbiculari vel late oblongâ, tenuiter membranaceâ, purpureo-suffusâ, petiolo nullo,