

## The *Ilex* - Complex in the Canary Islands and Madeira

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### Resumen

Revisión del género *Ilex* (Aquifoliaceae) de las Islas Canarias y Madeira. Discusión de los complejos como encontrados finalmente reconociendo tres especies, con dos subespecies cada uno. Se describe *Ilex platyphylla* ssp. *lopezlilloi* Kunkel, ssp. nov., de La Gomera, y se establece *I. canariensis* ssp. *azevinho* (Sol. ex Lowe) Kunkel, comb. nov.

The genus *Ilex* L. (Aquifoliaceae) consists of some 380 to 400 species and is widely distributed in the tropics, subtropics and temperate zones of both hemispheres. Some species are grown as hedges or are of ornamental value (viz *I. aquifolium* L.), and at least one species, the South American *I. paraguariensis* A.St-Hil., is of local importance and commercial value being the source of the famous Maté or Paraguay tea. I believe most species of this genus are evergreens.

Until recently it was supposed that only two species of *Ilex* are to be found in the Macaronesian region, viz *I. canariensis* Poir. (Canaries and Madeira), and *I. perado* Ait., a complex of subspecies clearly divided in archipelagos: ssp. *perado* in Madeira, ssp. *platyphylla* in the Canaries, and ssp. *azorica* in the Azores (Tutin 1933). Lems (1968) accepted these divisions (on variety level) but did not deal with the Azoran form. The occurrence of *I. perado* (var. *iberica* Loes.) in Portugal and Southern Spain is not mentioned in "Flora Europaea"; however D.A. Webb (Fl. Eur. 2:241) states that

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Fig. 1: *Ilex canariensis* ssp. *canariensis* (2/3); material from Gran Canaria.

"Wild plants with a larger proportion of their leaves entire seem to predominate in S. & E. Spain and in the Islas Baleares; they have been mistaken for 3 (**Ilex perado** Ait.) or distinguished as **I. balearica** Desf. (.). They all, however, possess some leaves with at least a few strong, patent, marginal spines, and in all other characters agree with 1" (**I. aquifolium** L.)

But, how clear is the situation in the Macaronesian Islands? If we accept the treatment of Lems (1968) there seems to be no problem. To quote:

"It is evident that **Ilex aquifolium** and **I. perado** have a similar ancestry, and that the varieties found on the various island groups each developed their individual character after becoming separated from their continental ancestor."

This might be true when dealing with the idealized descriptions which one comes across in literature on the subject (except Loesener). However problems arise when actually in the field and trying to recognize the several varieties or subspecies without reference to the natural geographical boundaries dividing these several forms. *Ilex canariensis* in Madeira differs considerably from the material commonly found in the Canary Islands, besides which the Madeira form of this species can also be localized in at least some of the Canary Islands. *Ilex platyphylla*, on the other hand, must be recognized as a "good species", or all of its forms should be lumped, together, as *lusus macaronesicus* of the common and quite variable Holly, *Ilex aquifolium* L. To make it worse: in Madeira *I. aquifolium* is cultivated in the Government Arboretum situated in the laurel forest belt, and some curious hybrids are already observed. The case is similar when referring to *Laurus*, a genus of only two species of which one is native in the same three archipelagos of the Macaronesian region.

To cut short this introduction I prefer to deal with the material as found in the two archipelagos (Canaries and Madeira), already aware that my treatment will be the cause of certain protest. However I shall persevere, and I wish to thank ICONA (Instituto Nacional para la Conservación de la Naturaleza) for their generous grant which made my work



in La Gomera, Tenerife and in Madeira possible. In Madeira I extend my thanks to my friend G. Maul, Curator of the Museu Municipal, and to the foresters of the Forest Department, Funchal, for their help and company while working in the field. My thanks are especially due to Don Juan Nogales (ICONA, Las Palmas), and to Don José Miguel González (Santa Cruz de Tenerife), for putting both “ways and means” at my disposal here, and to the foresters of La Gomera for their help while searching for specimens of the new subspecies which I wish to dedicate to Don Antonio López Lillo, Subdirector General of ICONA. I also thank my wife for the excellent drawings of specimens presented below.

*ILEX CANARIENSIS* Poir.

Poir., *Encycl. Méth. Suppl.* 3: 67 (1813)

A tree of the typical Macaronesian *Laurisilva*, up to 15 (20) m tall. Trunk straight, up to 50 cm in diameter, with a smooth, pale or dark grey, somewhat scaly bark. In the so-called *Fayal-Brezal* (a degenerated or secondary formation) of smaller dimensions. In La Gomera (Canary Islands) attacked by a still unknown disease which causes serious setbacks or even the death of many specimens. For further descriptions see Loesener (1901), although he describes this species as a “shrub or tree 3 to 7 meter tall”. See also M. A. & G. Kunkel (1974).

ssp. **canariensis** (fig. 1)

var. *a. typica* Loesener, *Mon. Aquif.* (1901)

Leaves oval-shaped or ovate-oblong, apex shortly acuminate; new leaves often somewhat spiny. Fruits short-stalked and rounded. — Canary Islands (Gran Canaria, Tenerife, Gomera, Hierro, Palma); Madeira ? — Common names: Aceviño, or Acebiño (Canaries).

ssp. **azevinho** (Sol. ex Lowe) Kunkel, **comb. nov.** (fig. 2)

*Ilex azevinho* Sol. ex Lowe, *Man. Fl. Mad.* 12 (1868)

*I. canariensis* var. *b. Azevinho* Loesener, l.c. (1901)

*I. maderensis* Willd. (1813), non Lam. (1801)

*I. aestivalis* Buch, non Lam.

Fig. 2: *Ilex canariensis* ssp. *azevinho* (Sol. ex Lowe) Kunkel (2/3): material from Madeira.

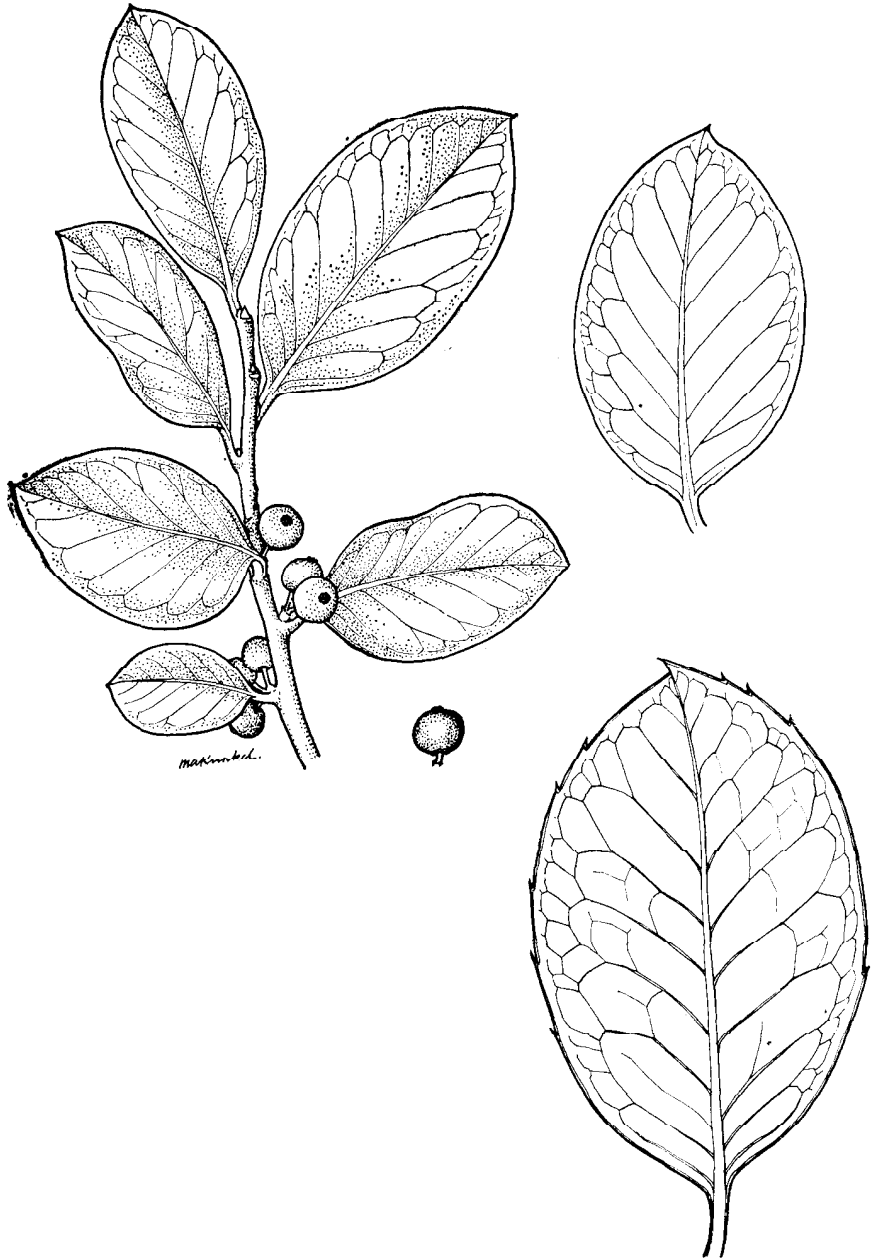


Fig. 3: *Ilex perado* ssp. *perado* (2/3); material from Madeira; below right, a young leaf from a root-shoot.

Leaves ovate-lanceolate, 9 x 3 cm., elongated towards the apex. Fruits long-stalked and olive-shaped. — This is the common form in Madeira; in the Canary Islands seen at least in La Gomera, and in the Mercedes forest, of Tenerife. — Common name: Azevinho (Madeira).

*ILEX PERADO* Aiton

Ait., Hort. Kew. 1: 169 (1789)

A shrub or small tree; much branched. Leaves oblong-elliptic or suborbicular, 3 - 7 cm and 2 - 5 cm broad; leaves of young shoots much larger. Apex mucronate; margin usually entire, or remotely spiny in young leaves. Fruits short-stalked and rounded. — This species, which seems restricted to Madeira and the Azores, has been dealt with by Lowe (1868), Loesener (1901) and, in a brief but deciding way, by Tutin (1933). In the sense of the present treatment, citations for the Canary Islands (Webb 1968, Franco 1971) seem erroneous or are not confirmed.

ssp. **perado** (fig. 3)

*Ilex crassifolius* Meerb, Pl.Sel.Ic. pict., tab. 4 (1789)

*I.maderiensis* (sic!) Lam., Dict. iii, 146 (1801), non Willd (1813)

*I.perado* var. *b. Maderensis* (Lam.) Loes., Mon. Aquif. (1901).

For descriptions see above and Lowe (1868), Loesener (1901, incl. subvars.), Menczcs (1914), Tutin (1933), etc. — Common name: Perado (Madeira).

ssp. **azorica** (Loes.) Tutin, Journ.Bot. 71: 100 (1933)

*Ilex perado* var. *azorica* Loesener, l.c. 247 (1901)

Not seen. Obviously with smaller leaves which are leathery and fleshy; see descriptions by Loesener (1901), Tutin (1933), and Webb (1968).

*ILEX PLATYPHYLLA* Webb & Berthelot

Webb & Berth., Phytogr. Canar. II: 135, t.68 (1842)

This species is evidently restricted to the Canary Islands; citations for Madeira (Loesener 1901) are in need of a critical revision. A highly variable tree, morphologically, showing the evolutionary trends mentioned by K. Lems (1967, 1968). The more common form is broad - or oval - leaved and it has rounded fruits; leaves of secondary shoots arising from the

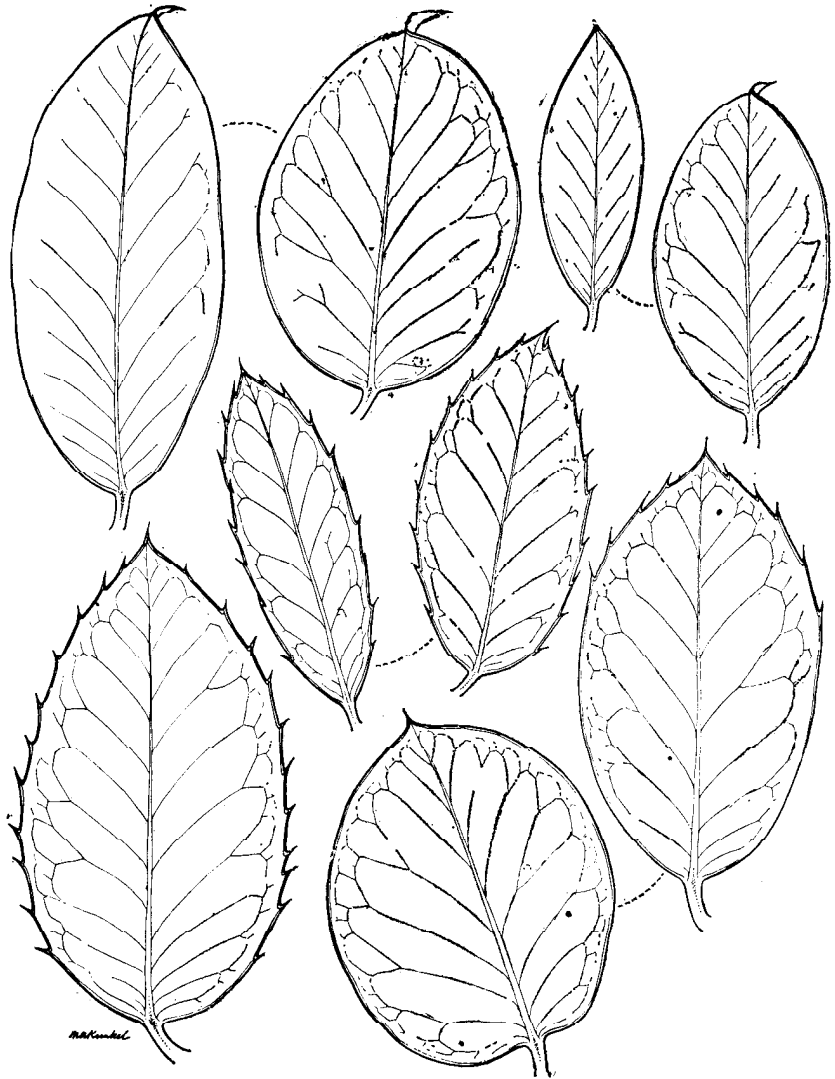


Fig. 4: *Ilex platyphylla* Webb & Berth. (1/2) showing the variability of mature (above) and young leaves (below). Material from Tenerife.



base or from roots are always strongly spiny (fig. 4). However there are narrow-leaved forms and, to cause further confusion, a form with almost olive-shaped fruits. The complex is in need of further investigation but it seems reasonable to describe the new Gomeran form as it is not known from any other island. — The species is accepted as being different from *I. perado* by Schenck (1907), Pitard & Proust (1908), Buchard (1929), Ceballos & Ortuño (1951), Bramwell (1974), and Lems (1960) although the latter author, in subsequent papers, kept to variety level.

ssp. **platyphylla** (fig. 5)

*Ilex perado* var. *platyphylla* Loesener, Mon. Aquif. 246 (1901)

*I. perado* ssp. *platyphylla* Tutin, Journ. Bot. 71: 100 (1933)

For general descriptions see Webb & Berthelot (1842), Hooker (1844), Loesener (1901), Bramwell (1974), and others. I may repeat a description given by Lems (1968):

"This holly is a tree to 30 feet high, with horizontal branches, bearing very large leaves, as much as 8 inches long; as on Madeira, there is much variation in the spines along the margin, but the leaf shape is more uniform, and much broader and rounder at the base than the Madeira type. This is the largest and best developed of the **perado** group; it produces abundant clusters or large red fruits in the leaf axils, on the older branches".

According to Burchard (1929) it is a huge tree with a silver-white stem reaching the same height as *Laurus*. — This subspecies seems endemic in Tenerife and La Gomera. Common name: Naranja or Naranja salvaje.

ssp. **lopezlilloi** Kunkel, **subsp. nov.** (fig. 6)

*Ab subspecies typica (platyphylla) foliis cuneatis et inflorescentiae multifloribus longipedunculatae differt. Frutex vel arbor ad 10 m. alta. Sempervirens. Petioli 1.5 - 2 cm. longi, breviter caniculatis. Lamina usque ad 15 cm. longa et 8 cm. lata, oblonga, obovata vel subspathulata, coriacea, viride-nitida, integerrima. Pedunculatae usque ad 2.5 cm. longae; drupa late subglobosa.*

*Holotypus*: Kunkel 18613, in Geneva; 22-VII-1975, La Gomera (Canary Islands), Ancón del Pajarito, 950 m. *Isotypus* in Herbaria ICONA Madrid and Santa Cruz de Tenerife.

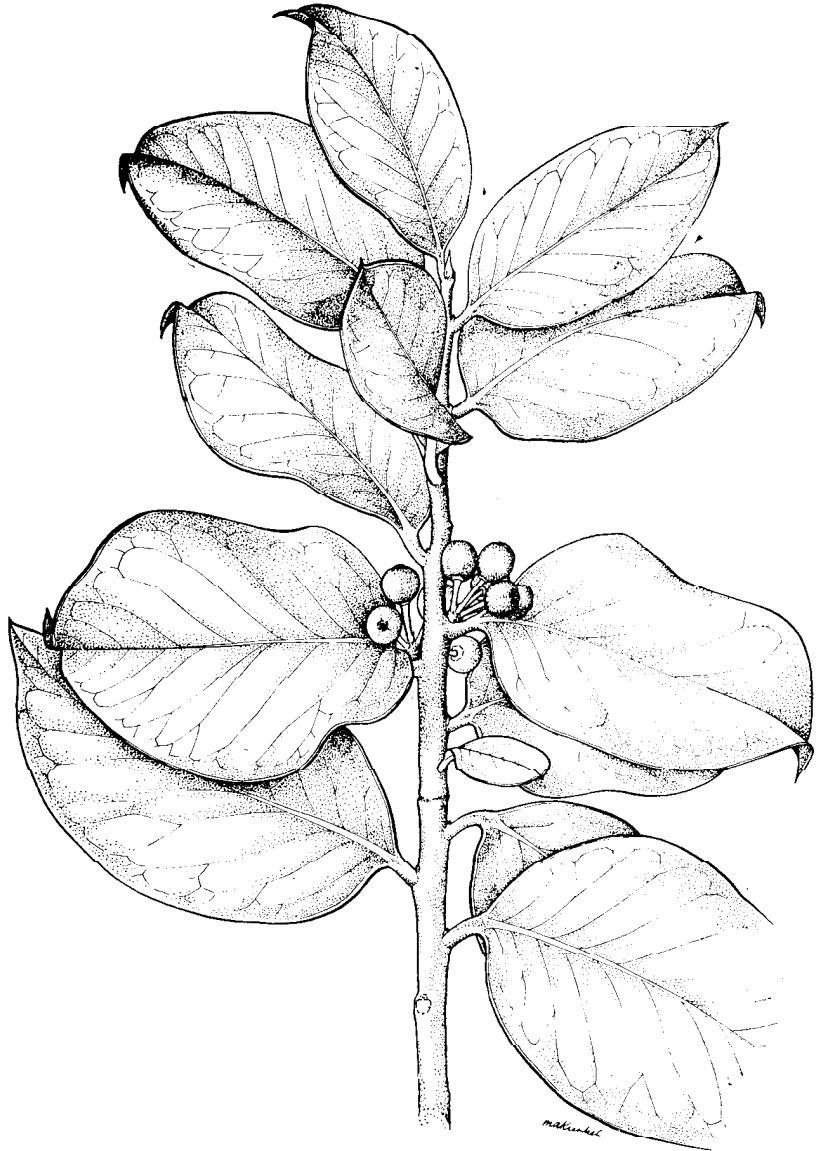


Fig. 5: *Ilex platyphylla* ssp. *platyphylla* (1/2); material from Tenerife.



Fig. 6: *Ilex platyphylla* ssp. *lopezlilloi* Kunkel (1/2); type material from La Gomera; flowers added a year later.

A large shrub or small tree up to 10 m tall. Trunk short but pronounced, or much branched from the base. Crown wide, branches horizontal or upright, lower branches hanging; young branches glossy green, with lenticells. Evergreen. Leaves petiolate; petiole 1.5 - 2 cm long, pale, slightly caniculate. Blade oblong, obovate or subspathulate, up to 15 cm. long and 8 cm broad, coriaceous, glossy dark green with pronounced ivory-coloured venation. Margin entire; even branches arising from root-shoots have entire leaves and only one leaf was found with a slight indication of a spiny margin. Blade often somewhat bent, apex short-pointed, base cuneate. Flowers white, in long-stalked axillary clusters; peduncles up to 2.5 cm long. Fruits subglobose, red, 9 - 10 mm in diameter. Flowering time May/June, fruiting July/August.

This tree was found in La Gomera: Ancón del Pajarito, in cliffs in the Laurel forest where it seems to be very rare. Another specimen was found in cliffs of the Ancón del Aceviño, under similar ecological and topographical conditions. Although I am more or less convinced that our new subspecies deserves specific recognition I feel somewhat cautious owing to the great variability of *Ilex platyphylla* s.str., and prefer therefore to keep the new finding on subspecific level, at least until further investigations have been carried out. -- The taxon is dedicated to Don Antonio López Lillo, actual Subdirector General for Conservation, of the official Spanish Instituto Nacional para la Conservación de la Naturaleza (ICONA). This form and the other *Ilex* are dealt with in my paper on the Laurel forest of La Gomera (Kunkel 1977).

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## RESEÑA

K. ESSER: *Kryptogamen*. Blaualgen, Algen, Pilze, Flechten. *Praktikum und Lehrbuch*. — Springer Verlag, XVI + 573 pp., 304 figs. Berlin — Heidelberg — New York 1976. DM. 58,— o US \$ 23,80.

El nuevo *Manual de Criptogamia* es introducido por anotaciones generales y sobre el cultivo y la preparación de las especies para su estudio respectivo. En la parte principal del libro se trata a especies y las características de cuatro divisiones de plantas inferiores: Schizophyta (Cyanophyceae), Phycophyta (Algas), Mycophyta (Hongos) y Lichenes (Líquenes), con descripciones generales, notas sistemáticas y datos sobre el ciclo regenerativo de estas. Interesante también son las discusiones críticas acerca la clasificación de estas clases y divisiones, los datos sobre la riqueza taxonómica existente así como las ideas acerca de experimentos propuestos para las clases prácticas.

El libro es muy útil, sin duda alguna, y es bien ilustrado. El papel empleado también es excelente y el precio de la obra no es exagerado. Lamentablemente, por su estilo de impreso parec ser un tiposcrito multicopiado de aspecto inferior que influye, a primera vista, al contenido tan formidable.

G. K.

## RESEÑAS

B.E.S. GUNNING & A.W. ROBARDS (eds.): *Intercellular communications in plants. Studies on Plasmodesmata*. — Springer Verlag; XVI + 387 pp., 90 figs.; Berlin — Heidelberg — New York 1976. DM 72,— o US \$ 29,60.

El presente resumen sobre la *Comunicación intercelular en plantas* resultó de un simposio, aparentemente realizado en 1976 (?), en Australia. Contribuyen 13 autores (más 18 que participaron en las discusiones), en su mayoría australianos: citólogos, fisiólogos, virólogos, etc., todos aquellos interrelacionados por sus trabajos tratando o influenciados por el plasmodesma, aquellos filamentos plasmáticos que comunican los protoplasmas de células contiguas.

El libro contiene los siguientes capítulos: Introducción a las plasmodesmata (plural), por B.E.S. Gunning. Las plasmodesmata en plantas superiores, por A. W. Robards; Plasmodesmata en algas y hongos, por H. J. Marchant; Origen y desarrollo de las plasmodesmata, por M.G.K. Jones; Tasación físico-química del transporte plasmodesmatal, por W.P. Anderson; evidencia fisiológica de la comunicación intercelular en el simplasto, por P.B. Goodwin; Evidencia citoquímica del transporte iónico a través de las plasmodesmata, por R. F. M. van Steveninck; Los virus y las plasmodesmata, por A.J. Gibbs; Conducción a través del plasmodesma en los nudos de Chara, por N. A. Walker; el papel de plasmodesmata en el transporte de agua y sustancias alimenticias a través de las raíces, por A.W. Robards & D. T. Clarkson, etc., para terminar en capítulos como Perspectivas históricas sobre plasmodesmata (por D. J. Carr) y en un resumen sobre plasmodesmata: conocimientos actuales y problemas destacados.

G. K.

H. LIETH & R. H. WHITTAKER (eds.): *Primary productivity of the Biosphere*.— Ecological Studies 14 (eds.: J. Jacobs, O. L. Lange, J. S. Olson & W. Wieser); Springer Verlag, VIII + 339 pp. 67 figs.; 46 tabs.; Berlín — Heidelberg — New York 1975. DM 69,40 o US \$ 28,50.

El tomo 14 de los bien recibidos "Estudios Ecológicos" trata la *Productividad primaria de la Biósfera*, es decir el "turnover biológico" en los varios ecosistemas hidrológicos como terrestres. Con las contribuciones de 12 ecólogos (de 7 universidades) estamos realizando una obra de investigación que nos introduce a la aportación de la biósfera en cuanto a los fundamentos de la alimentación del hombre y de todos los organismos heterotróficos. Con la creciente demanda de una presión demográfica sin antecedentes, el aprovechamiento racional (o irracional) de los recursos naturales exige inventarios, cálculos y, sobre todo, una idea acerca de su aprovechamiento sin explotación excesiva.

El presente tomo originó gracias a los trabajos avanzados del Programa Biológico Internacional, en conexión con un simposio organizado por el Instituto Americano de Ciencias Biológicas (Miami, 1971). Se incluye una reseña histórica sobre la productividad primaria en general, seguido por varios capítulos tratando los métodos y medidas de esta producción para luego (4 capítulos) entrar en las materias de esta productividad a vista más bien global. La última parte (4 capítulos) trata la modulación, la evaluación y los prospectos de esta "productividad primaria", en especial cuando relacionando el hombre con la biósfera. Una nueva contribución de la Casa Editora Springer, una nueva obra biológica, y un nuevo estímulo acerca de otros estudios de realizar.

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