

**ILLUSTRATIONS OF
CONIFERS; VOL. II**

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Illustrations of conifers; Vol. II by H. Clinton-Baker

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H. CLINTON-BAKER

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OF

CONIFERS

By H. CLINTON-BAKER.

VOLUME II.

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A B I E S.

EVERGREEN trees belonging to the Coniferae, with tall straight trunks regularly whorled with branches. Buds at the ends of the shoots either resinous or non-resinous. Leaves persistent for many years, variously arranged on the branchlets; on lateral shoots pectinate, radially arranged or crowded and directed forwards in imbricated ranks. On leading shoots the leaves are radially arranged and on cone-bearing branches they are directed upwards.

Leaves linear, flattened or quadrangular in section, upper surface green, with or without stomata; lower surface with two white or greyish bands of stomata; apex rounded, single-pointed or notched.

Flowers monœcious. Cones ripening in one year, erect on the branchlets, composed of thin woody scales, longer or shorter than the bracts; seeds two on each scale, winged and provided with resin vesicles. The cone on maturity falls to pieces, the scales, bracts and seeds separating from the central spindle-like axis.

Abies are easily distinguished from all other conifers by the circular base of the leaves, which, on falling or when pulled off show a circular scar on the branchlet.

About 80 species of Abies have been described, natives of the temperate regions and with a few exceptions confined to mountainous districts.

KEY TO ABIES.

This key is based upon characters taken from the foliage, buds and shoots of lateral branches on the lower part of the tree.

I.—LEAVES RADIALY ARRANGED ON THE BRANCHLETS; APEX OF THE LEAF NOT BIFID.

- A. Pinsapo*, Boissier; Spain. Leaves rigid, short, less than $\frac{1}{2}$ inch long, thick, with lines of stomata on each surface, acute at the apex; resin canals median. Shoots glabrous. Buds resinous.
- A. cephalonica*, Loudon; Greece. Leaves thin, flattened, about 1 inch long, white with stomata beneath, ending in a sharp cartilaginous point; resin-canals marginal. Shoots glabrous. Buds resinous.

II.—LEAVES ON THE LATERAL BRANCHES PECTINATE IN ARRANGEMENT; THE TWO LATERAL SETS EITHER IN THE HORIZONTAL PLANE OR WITH THEIR UPPER RANKS DIRECTED UPWARDS AS WELL AS OUTWARDS SHOWING A V-SHAPED DEPRESSION, AS SEEN FROM ABOVE, BETWEEN THE TWO SETS.

Resin-canals marginal.

- A. bracteata*, Nuttall; California. Leaves long, 2 inches or more, rigid, white with stomata beneath, ending in a spine-like point. Shoots glabrous. Buds large, elongated, fusiform, membranous, non-resinous.
- A. grandis*, Lindley; western N. America. Leaves all in the horizontal plane, those in the upper rank about half the length of those below, up to 2 inches long, bifid at the apex; upper surface grooved; lower surface with bands of stomata. Shoots minutely pubescent. Buds small, resinous.
- A. Lowiana*, Murray; California. Leaves in a V-shaped arrangement, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, bifid at the apex; upper surface grooved and with stomata; lower surface with white lines of stomata. Shoots and buds as in *A. grandis*.
- A. firma*, Siebold and Zuccarini; Japan. Leaves in a V-shaped arrangement, rigid, very coriaceous, broad, up to $1\frac{1}{2}$ inch long, with broad lines of stomata on lower surface, ending in two sharp cartilaginous points. Shoots pubescent in the furrows between the slightly raised pulvini. Buds small, ovoid, slightly resinous.
- A. pectinata*, De Candolle; Europe. Leaves pectinate in one plane or tending to a V-shaped arrangement, about an inch long, with white lines of stomata beneath, slightly bifid at the apex. Shoot grey with short pubescence. Buds ovoid, non-resinous.
- A. Webbiana*, Lindley; Himalayas. Leaves V-shaped in arrangement, up to $2\frac{1}{2}$ inches long, bifid, silvery white beneath. Shoots with prominent pulvini and deep grooves, with a reddish pubescence confined to the grooves. Buds large, globose, resinous.

Resin-canals median.

- A. balsamea*, Miller; eastern N. America. Leaves slender, scarcely 1 inch long, bifid at the apex, with grey lines of stomata beneath. Shoots smooth, grey, with scattered, short erect pubescence. Buds globose, resinous.
- A. Fraseri*, Poiret; Alleghany Mountains. Leaves as in *A. balsamea*, but shorter and whiter beneath. Shoots smooth, yellowish, with dense, reddish, curved or twisted pubescence. Buds globose, resinous.
- A. brachyphylla*, Maximowicz; Japan. Leaves in a V-shaped arrangement, short, scarcely exceeding $\frac{1}{2}$ inch, slightly bifid, white beneath. Shoots glabrous, with prominent pulvini and deep grooves. Buds conical, resinous.

¹*A. cilicica* and *A. numidica* with weak shoots, come in this section.

III.—LEAVES ON LATERAL BRANCHES NOT PECTINATE ABOVE, BUT DENSELY CROWDED, THOSE IN THE MIDDLE LINE DIRECTED FORWARDS IN IMBRICATED RANKS, THEIR BASES NOT BEING APPRESSED TO THE BRANCHLET. ON THE LOWER SIDE OF THE SHOOT THE LEAVES ARE IN TWO LATERAL SETS.

Resin-canals marginal.

- A. *Nordmanniana*, Spach²; Caucasus. Leaves up to 1½ inch long, with white lines of stomata beneath, with rounded bifid apex. Shoots smooth, with short scattered erect pubescence. Buds ovoid, brown, non-resinous.
- ☞ A. *amabilis*, Forbes; western N. America. Leaves in arrangement and size like those of *A. Nordmanniana*, but much darker shining green and with a truncate bifid apex, with white bands of stomata beneath; they emit a fragrant odour when bruised. Shoots smooth, with short wavy pubescence. Buds small, globose, resinous.
- A. *veligosa*, Schlechtendal; Mexico, Guatemala. Leaves about 1 inch long, with whitish lines of stomata beneath, gradually narrowing from the middle to the usually entire apex which is occasionally slightly emarginate. Shoots with prominent pulvini and dense minute erect pubescence. Buds shortly cylindrical, resinous. The median upper leaves are much less numerous than in the two preceding species.
- A. *Mariesii*, Masters; Japan, Formosa. Leaves shorter and broader than in *A. Veitchii*, with white bands of stomata beneath, widest in their upper third, with a rounded and bifid apex. Shoot densely covered with a ferruginous pubescence. Buds small, globose, resinous.

Resin-canal median.

- A. *Veitchii*, Lindley; Japan. Leaves up to 1 inch long, truncate and bifid at the apex, uniform in width, silvery white beneath. Shoots smooth, covered with dense short erect pubescence. Buds small, globose, resinous. The upper median leaves point forwards and stand off from the shoot at a wider angle than in *A. Nordmanniana*.
- A. *sachalinensis*, Masters; Saghalien, Yezo, Kurile Isles. Leaves long and slender, up to 1½ inch, uniform in width, with a rounded and bifid apex, silvery-white beneath. Shoots with prominent pulvini, and a dense, short pubescence confined to the grooves. Buds small, globose, resinous.
- A. *sibirica*, Ledebour; N.E. Russia, Siberia, Turkestan. Leaves long and slender, up to 1½ inch, with narrow white bands of stomata beneath, uniform in width; apex rounded and either slightly bifid or entire. Shoots ashy grey, quite smooth, with a scattered minute pubescence. Buds small, globose, resinous.

IV.—LEAVES ON LATERAL BRANCHES NOT PECTINATE ABOVE; THOSE IN THE MIDDLE LINE COVERING THE BRANCHLET, AND CURVING UPWARDS AFTER BEING APPRESSED TO THE SHOOT FOR SOME DISTANCE AT THEIR BASE. THE LEAVES ARE IN TWO LATERAL SETS ON THE LOWER SIDE OF THE BRANCHLET. RESIN-CANALS MARGINAL.

- A. *nobilis*, Lindley; Washington, Oregon, California. Leaves above closely appressed by their bases to the branchlet which they completely conceal; about 1 inch long, entire at the apex, flattened, grooved on the upper surface in the middle line; stomata usually present on both surfaces. Shoots with a dense, short, brown pubescence. Terminal buds girt at the base by a ring of acute or subulately-pointed pubescent scales.
- A. *magaiifolia*, Murray; Oregon, California. Leaves above appressed at their bases for a short distance only to the branchlet, which they do not completely conceal; longer than in *A. nobilis*, up to 1½ inch, entire at the apex, quadrangular in section, not grooved on the upper surface; stomata always present on both surfaces. Shoots and buds as in *A. nobilis*.

¹*A. nemidosa* with strong shoots is distinguished from all these species by the leaves of the upper side being directed backwards.

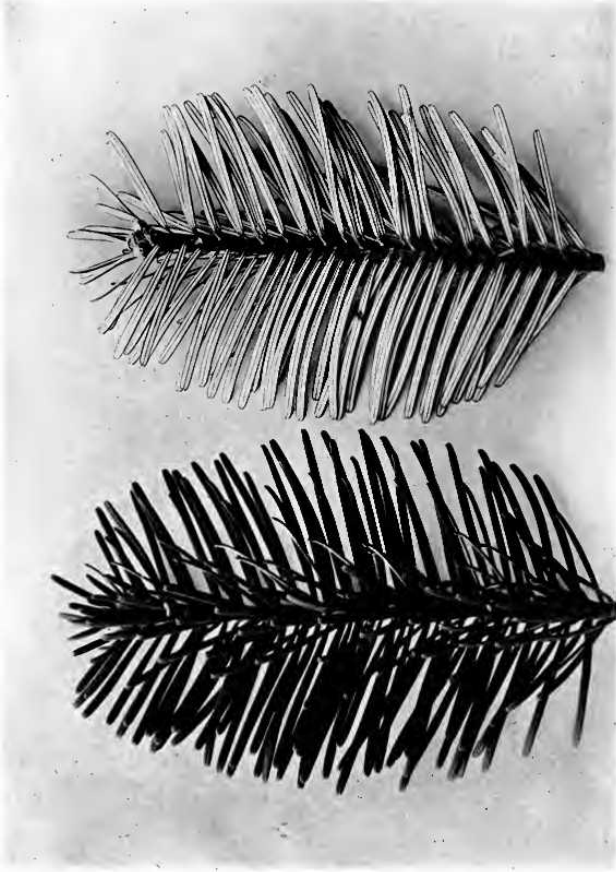
²*A. cilicica*, with strong shoots, resembles a weak *A. Nordmanniana*.

V.—LEAVES ON LATERAL BRANCHES ARRANGED IN TWO WAYS WHICH ARE OFTEN OBSERVABLE ON THE SAME TREE AND DEPEND UPON THE VIGOUR OF THE SHOOTS.

- A. cilicica*, Carrère; Asia Minor. Leaves either (A) pectinate above with a V-shaped depression between the lateral sets, or (B) with the median leaves above crowded and covering the branchlet, as in *A. Nordmanniana*. The leaves are slender, up to $1\frac{1}{2}$ inch long, not conspicuously white below, slightly bifid at the rounded or acute apex; resin-canals marginal. Shoots smooth, with scattered short erect pubescence. Buds small, ovoid, non-resinous. Vigorous shoots of this species resemble a weak *A. Nordmanniana* but with the leaves shorter, more slender and less white beneath. The buds are much smaller.
- A. numidica*, De Labroy; Algeria. Leaves either pectinate above with a V-shaped depression, or crowded and covering the upper side of the branchlet, but different from all other species in the median leaves above, in that case being directed backwards and not forwards. Leaves short, up to $\frac{1}{2}$ inch long, broad, rounded at the entire or slightly bifid apex; in most cases with four to six broken lines of stomata on their upper surface near the tip, lower surface with white lines of stomata; resin-canals marginal. Shoots brown, shining, glabrous. Buds large, ovoid, non-resinous.

VI.—LEAVES IRREGULARLY ARRANGED; THOSE ON THE LOWER SIDE OF THE BRANCHES NOT TRULY PECTINATE.

- A. Pindrow*, Spach; W. Himalayas. Leaves all directed more or less forwards; those above irregularly and imperfectly covering the branchlet; those below mostly pectinate but with some directed downwards and forwards. Leaves soft, pale green, up to $2\frac{1}{2}$ inches long, lower surface with grey lines of stomata, bifid at the apex with two sharp cartilaginous points; resin-canals marginal. Shoots grey, glabrous. Buds large, globose, resinous.
- A. concolor*, Lindley and Gordon; Colorado, Utah, Arizona, New Mexico, Northern Mexico, Southern California. Leaves imperfectly pectinate both above and below, some in the middle line being always directed forwards and not laterally outwards; up to 2 to 3 inches long; apex entire; upper surface convex and not grooved, with lines of stomata; resin-canals marginal. Shoots smooth, olive-green, glabrous. Buds large, conical, resinous.
- A. lasiocarpa*, Nuttall; western N. America. Leaves either in an imperfectly pectinate arrangement or with most of the leaves directed upwards, those in the middle line above crowded and standing edgeways; $1\frac{1}{2}$ inches long, narrow, usually entire, with conspicuous lines of stomata on the upper surface, especially in their anterior half. Resin-canals median. Shoots smooth, with a moderately dense, short, wavy pubescence. Buds small, conical, resinous.



ABIES AMABILIS.