

APPENDIX 2

BOTANICAL ILLUSTRATIONS

Botanical illustration is the preparation and presentation of line drawings or paintings of plants and plant parts. Although photography is perhaps the primary medium of image documentation (and should be encouraged in field and laboratory classes), illustration is an important component of plant systematics studies and is generally required in publications to document features that are described. Illustrations are also important didactic tools in that they promote careful and complete observation of features; going through the process of drawing often helps an investigator to see more and in greater detail.

Illustrations in plant systematic research are almost always line drawings. Line drawings typically begin with a pencil drawing, which alone may be sufficient for personal observations and data collection. For publication-quality illustrations, pencil drawings must be retraced in black ink and are typically stippled for a shaded, three-dimensional appearance (see Figure A2.1). Alternatively, line drawings with shading may be computer generated using graphics software.

Basic supplies needed for pencil line drawings include a 2H or 3H pencil, high-quality eraser, and drawing paper (ranging from generic white to artist's drawing paper). A clipboard or artist's drawing board is handy to secure the paper. Drawings may be made free-hand. More precise drawings can be made using a camera-lucida/drawing tube device. Such an optical device allows one to see a double image of the object to be drawn plus the hand and pencil, allowing quick and easy tracing of object features. Pencil drawings should consist of outlines of whole organs/parts and of individual components. Lines should be crisp and precise. Minimize shading; shade only when objects are darker and then only lightly with pencil.

Drawings should be labeled clearly, including (a) name of taxon and documentation of material (e.g., reference to

a voucher specimen), and (b) names of structures, indicating all pertinent terms, with lines or arrows leading from the structure to the term label. A metric magnification scale bar should accompany each drawing. A scale bar (e.g., "5 mm") is much preferred over a simple magnification listing (e.g., "25×") because the scale bar remains to scale with any subsequent enlargement or reduction of the drawing. The size of drawings should be planned for a final size reduction (after inking and stippling) of approximately 50–75%, which yields a better final product.

WHAT TO DRAW

A complete illustration of plant morphology may include drawings of the following (Figure A2.1): (a) the whole plant at low magnification, showing the plant habit, branching pattern and overall form; (b) one or more leaves, showing leaf attachment to the stem; (c) a flower in front, oblique, and/or side view; (d) a flower in median longitudinal (sagittal) section; (e) androecium, especially stamen/anther close-up; (f) gynoecium; (g) ovary longitudinal- and/or cross-section; and (h) close-ups of other floral parts of significance.

In addition to drawing real views of plant parts, diagrams may be drawn to illustrate the relative position of parts. **Floral diagrams** (Figures A2.1H, A2.2) show the relative position, aestivation, and fusion of perianth parts, stamens, and pistil(s)/carpels. For showing the relative position of floral parts, a diagram of the floral axis is typically indicated at the top of the drawing, corresponding to the posterior side of the flower. The floral diagram begins at the center of the flower. On a sheet of paper, draw the pistil(s) as appearing in cross-sectional view, carefully denoting ovary wall, septa, ovules, and placentation. Next, stamens are drawn surrounding the gynoecium. Stamens are drawn as anther cross-sections (internal contents such as microsporangia usually not denoted),

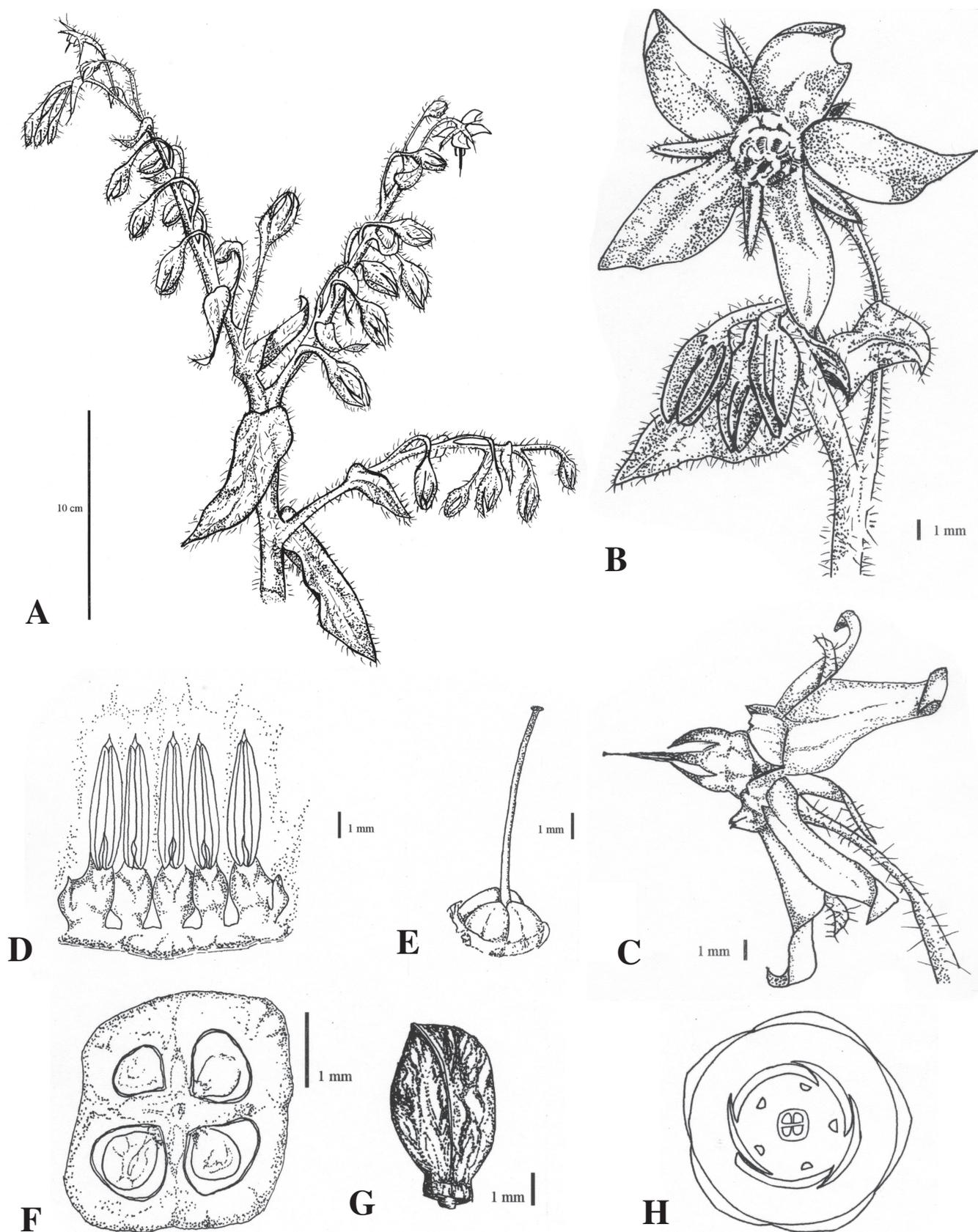


FIGURE A2.1 Example of illustrations, showing stippling and scale bars. *Borego officinalis*. **A**. Whole inflorescence and leaves. **B**. Flower, face view. **C**. Flower, side view. **D**. Androecium, spread flat, adaxial view. **E**. Gynoecium. **F**. Ovary cross-section, base of ovary. **G**. Fruit. **H**. Floral diagram. (Contributed by Dinna Estrella, student in Plant Systematics class.)

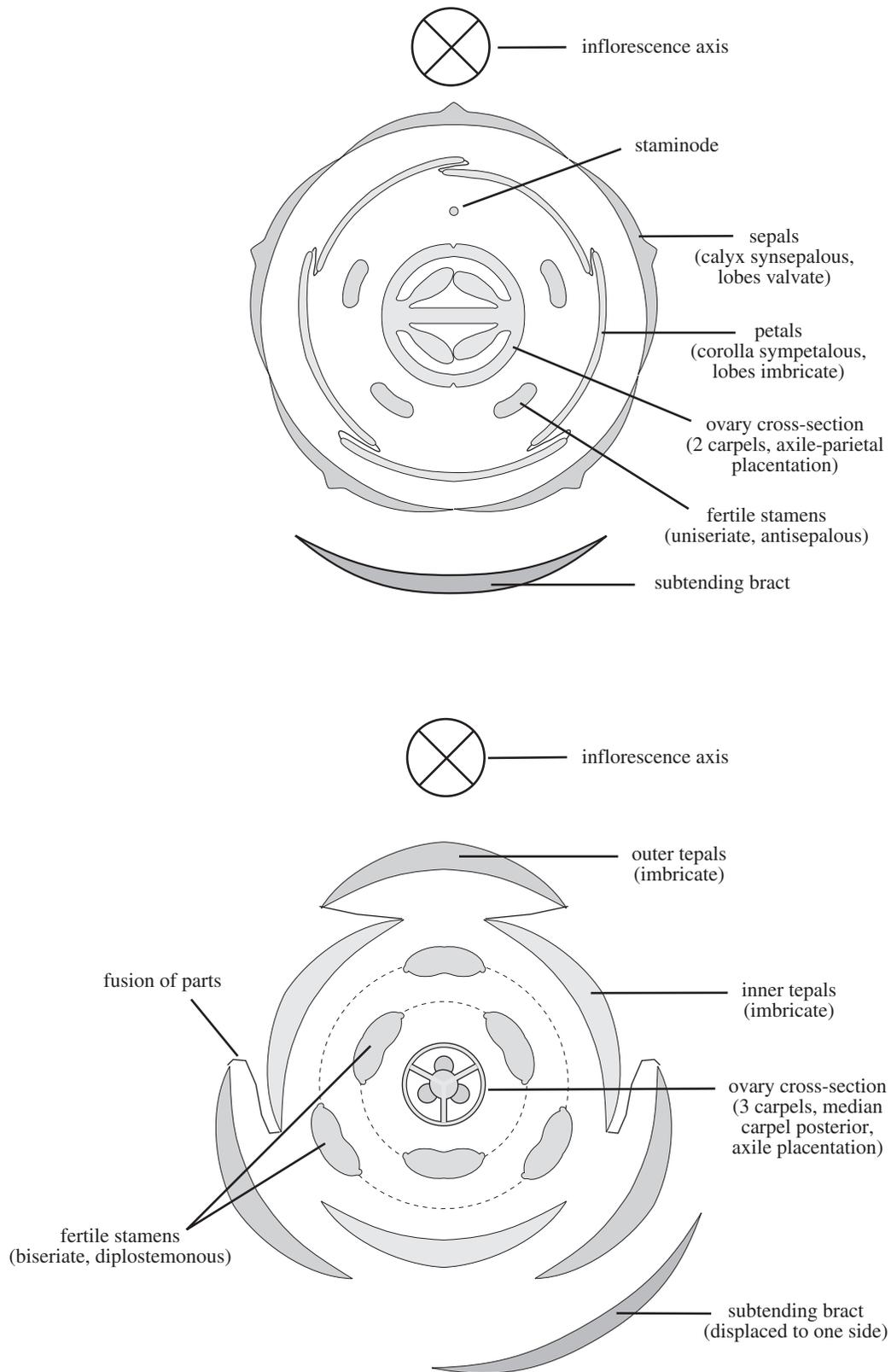


FIGURE A2.2 Examples of floral diagrams.

with the direction of dehiscence indicated. Petals (or corolla lobes) and sepals (or calyx lobes) are drawn surrounding the gynoecium and androecium. These perianth parts are drawn as in cross-section, with careful attention to relative position and aestivation. Bracts are drawn similar to perianth parts, at their position of attachment. Any connation or adnation of parts is drawn either as organs contacting one another or as

lines drawn between fused structures. If the flower is more or less erect, a circle is drawn that indicates the relative position of the axis to which the flower is attached. If the flower is horizontal in orientation, parts may be drawn as if the opening of the flower is facing the observer. If flowers are unisexual, male and female flowers should be drawn separately, of course.

REFERENCES FOR FURTHER STUDY

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