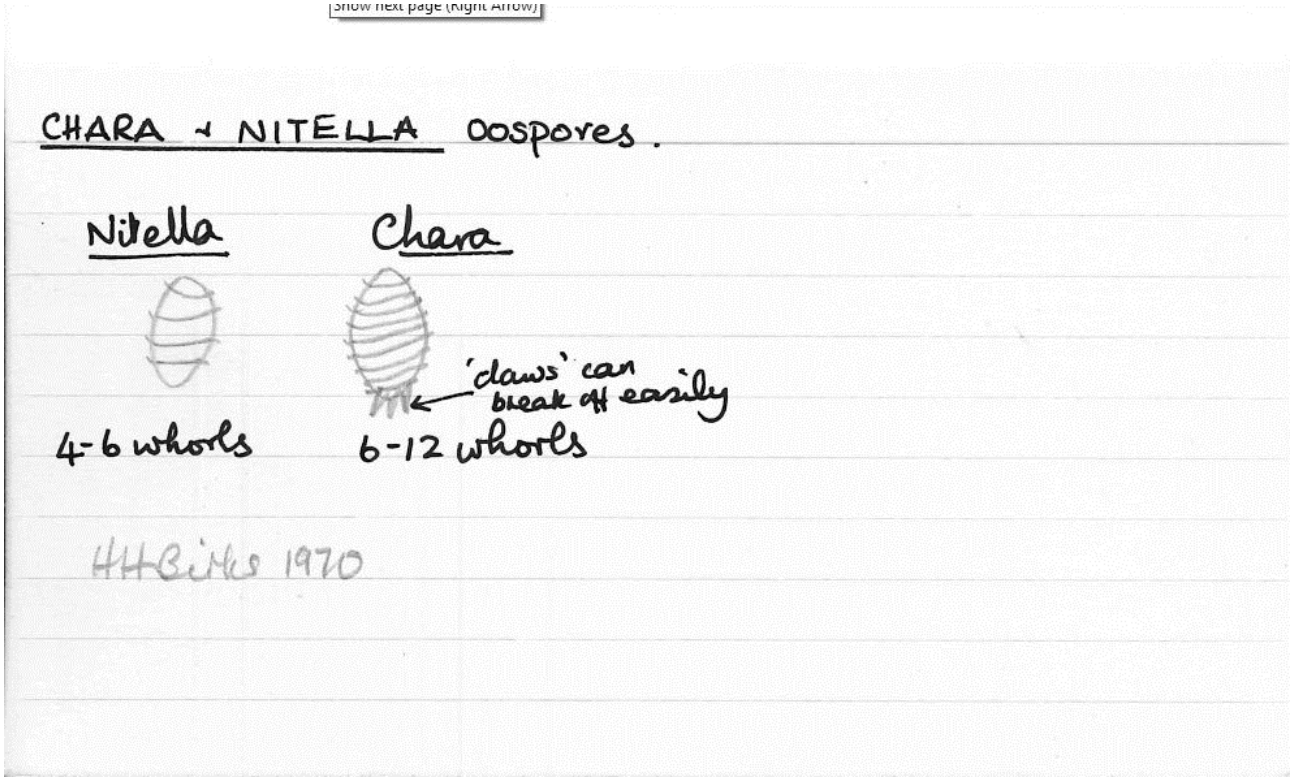
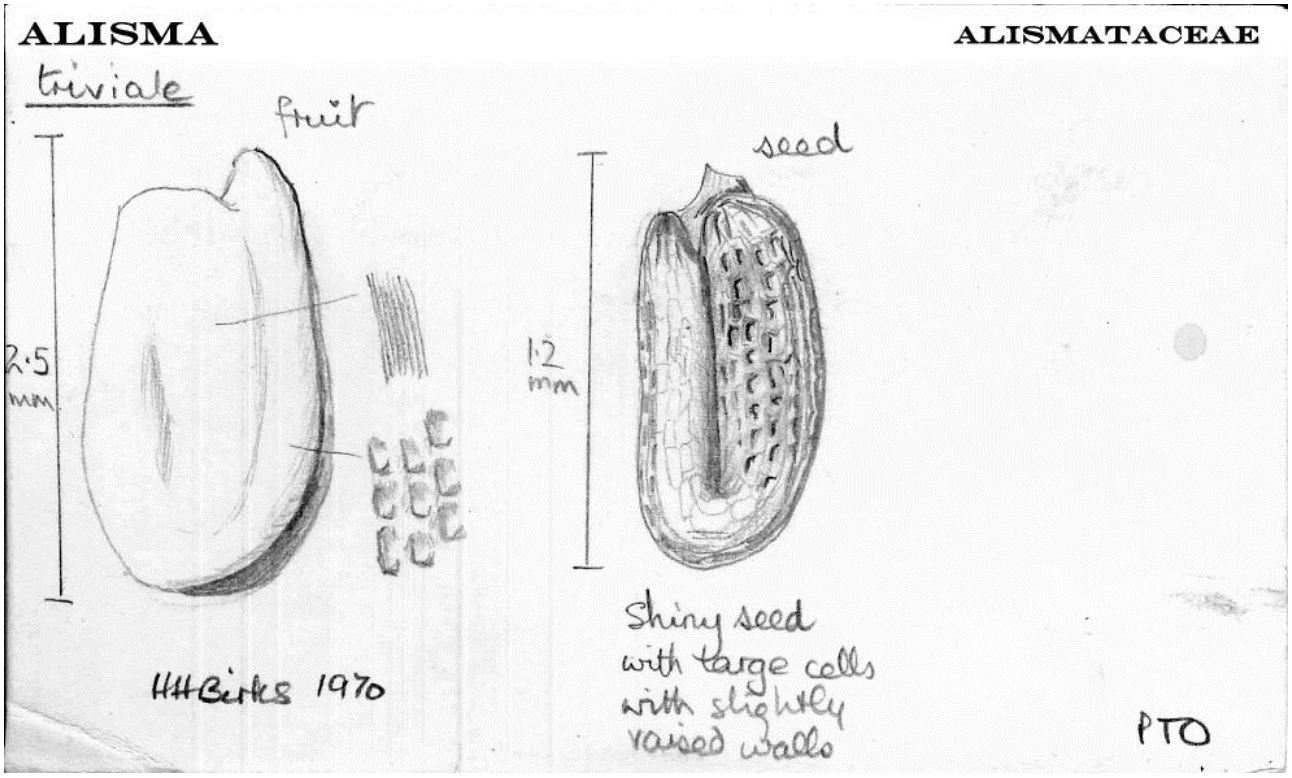
ALGAE

Chara* & *Nitella



ALISMATACEAE

Alisma triviale



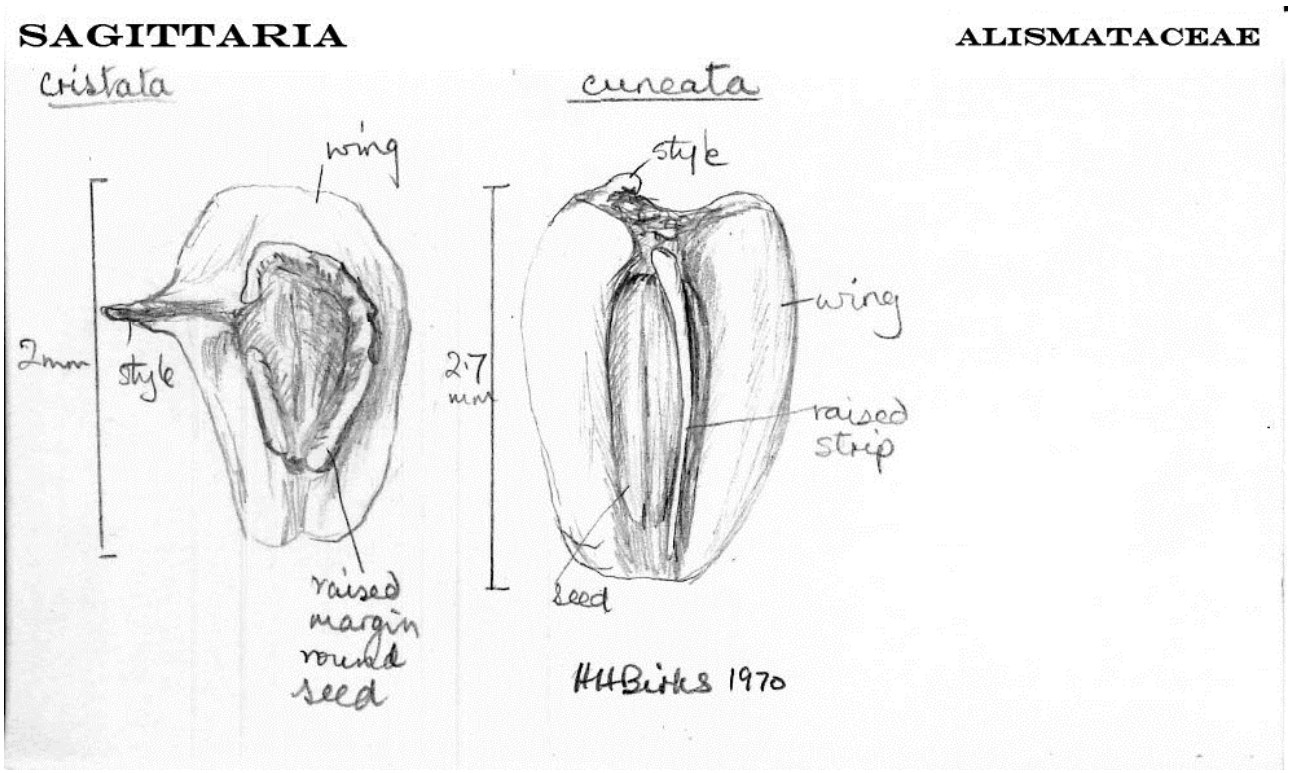
Alisma subcordatum seeds are similar

A. gramineum are also similar but about 1·5 mm

Lophotocarpus calycinus. Narrow arm is shorter than wide arm, and fruit is also more assymetrical

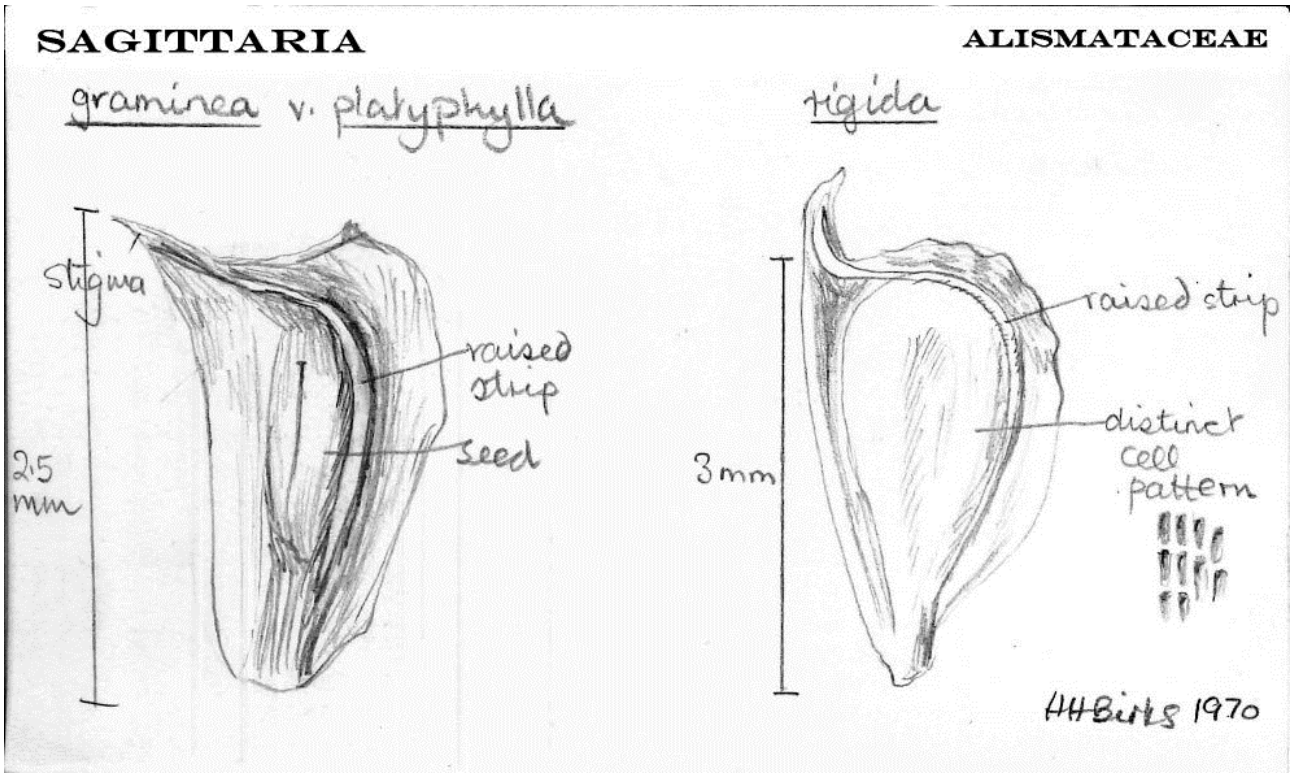
Sagittaria

cristata, cuneata



Sagittaria

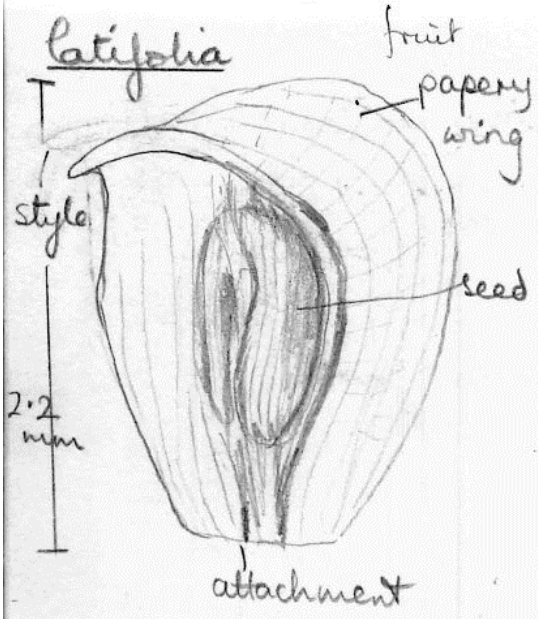
graminea* var. *platyphylla, rigida



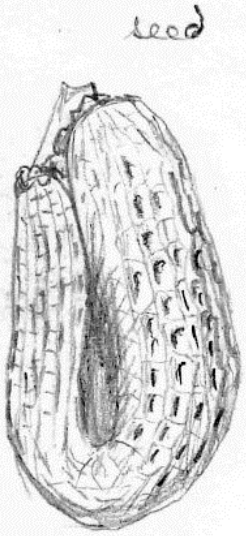
Sagittaria latifolia

SAGITTARIA **ALISMATACEAE**

latifolia



HHBirkes 1970



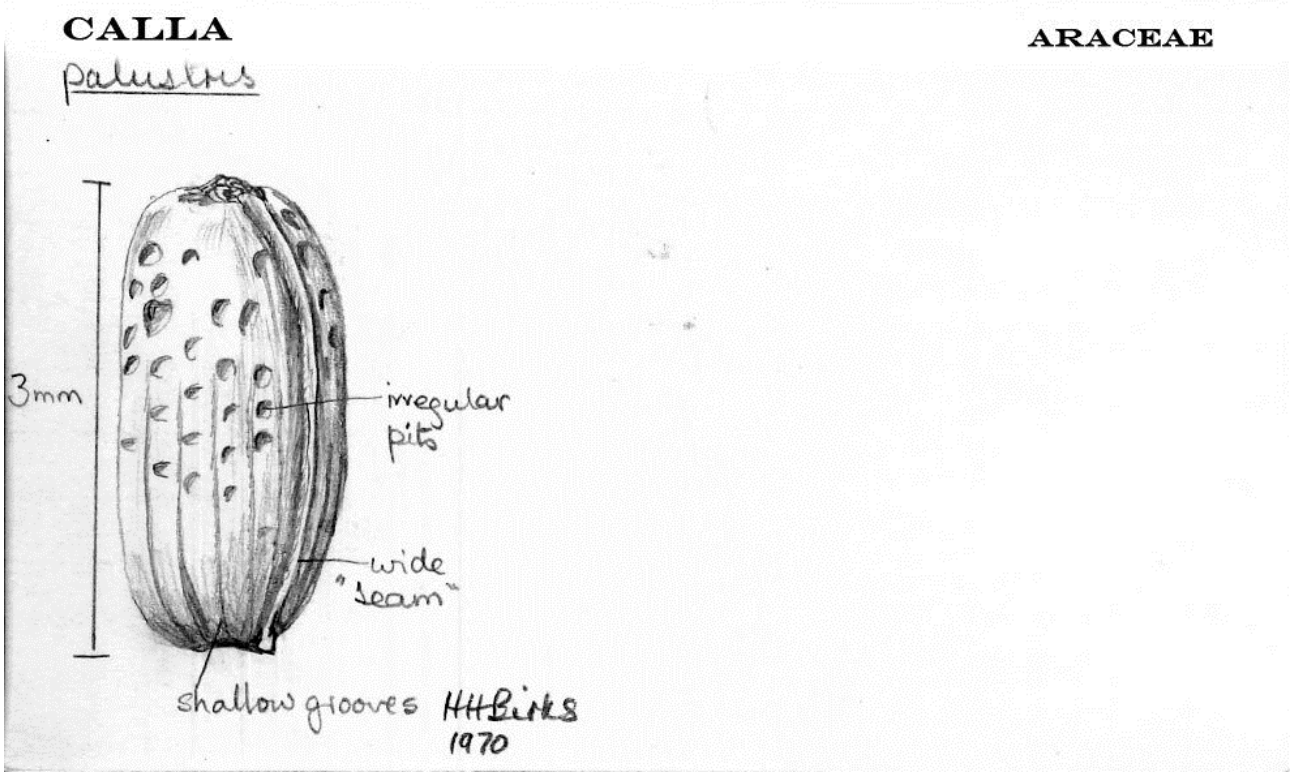
Shiny, with large cell pattern as in Alisma

Native to Minnesota

S. cristata	Alisma gramineum
S. cuneata	A. subcordatum
S. graminea	A. triviale
S. latifolia	
S. rigida	Lophotocarpus calycinus

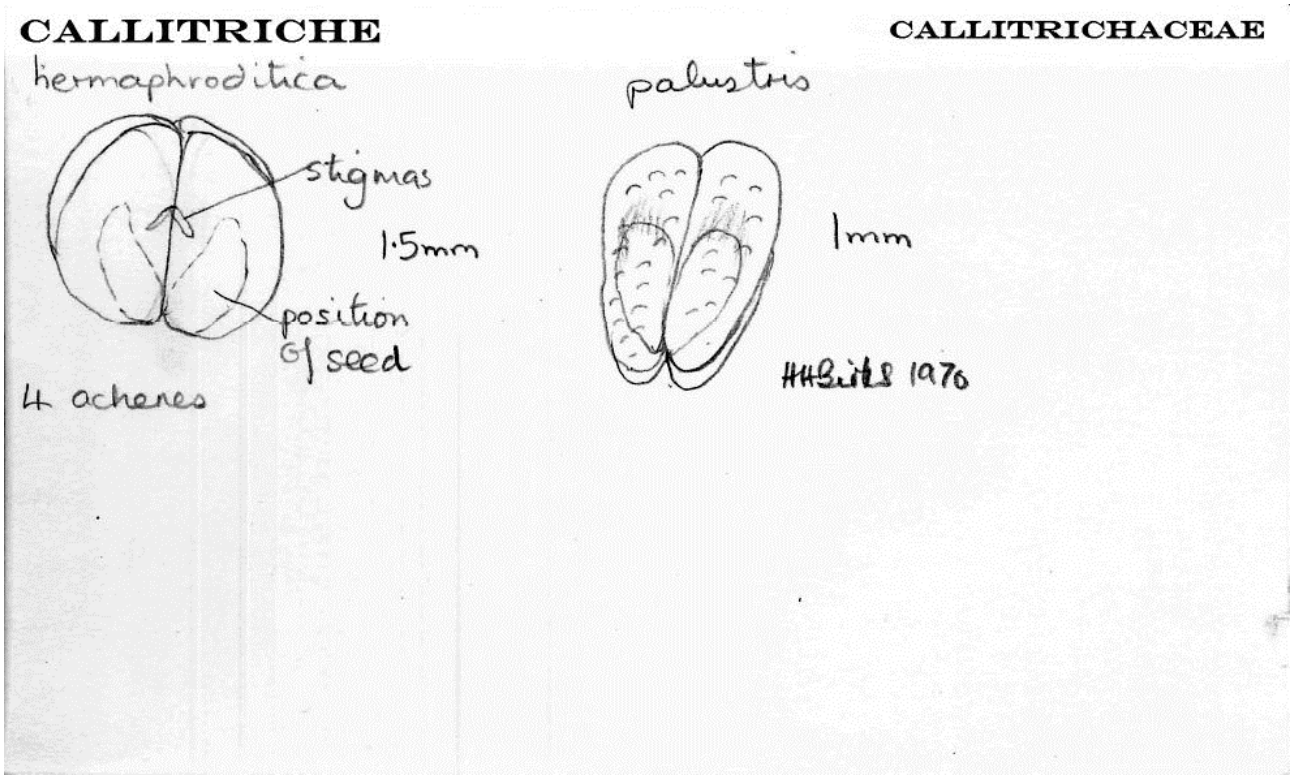
ARACEAE

Calla palustris



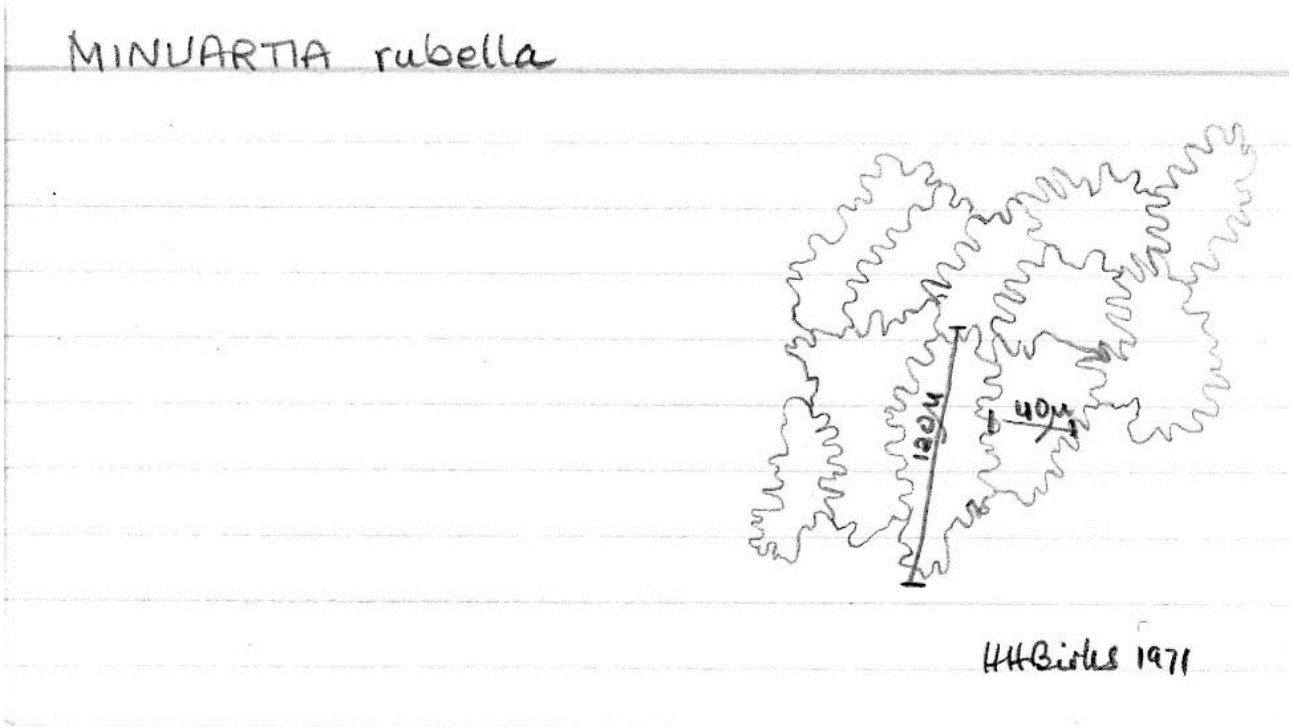
CALLITRICHACEAE

Callitriche hermaphroditica



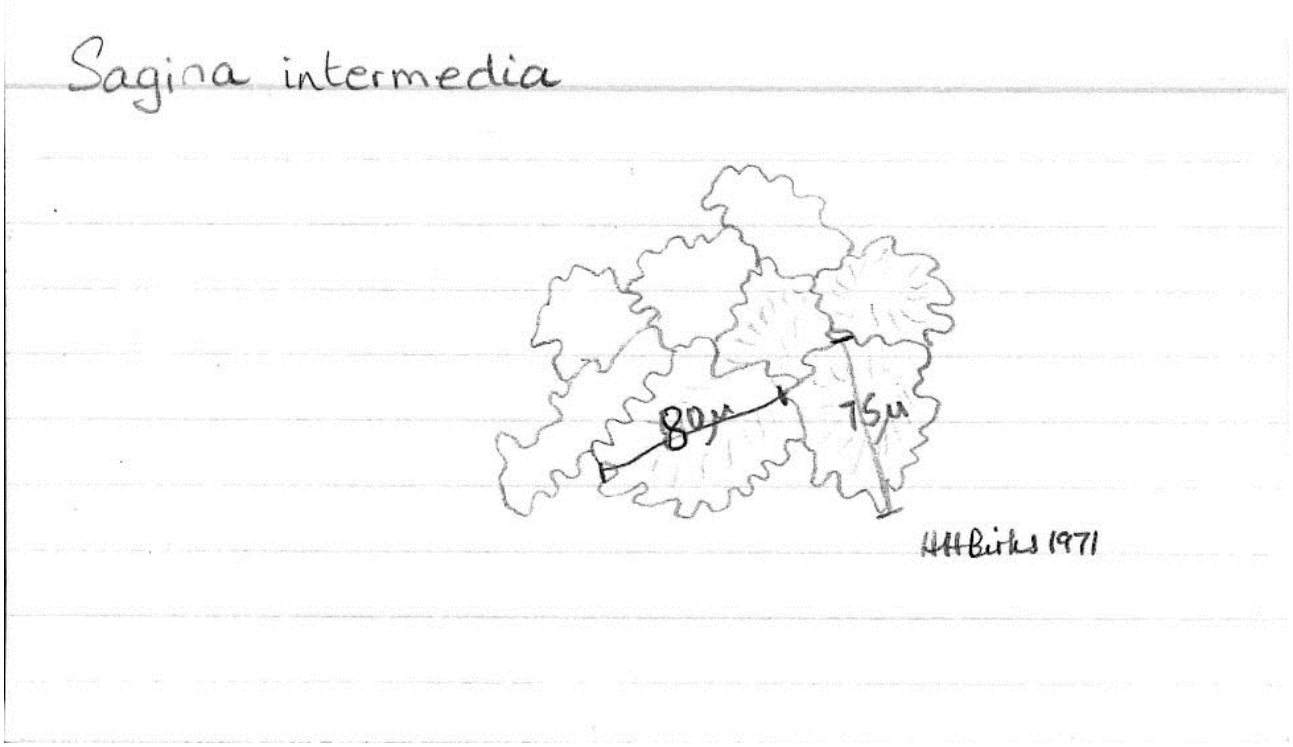
CARYOPHYLLACEAE

Minuartia rubella

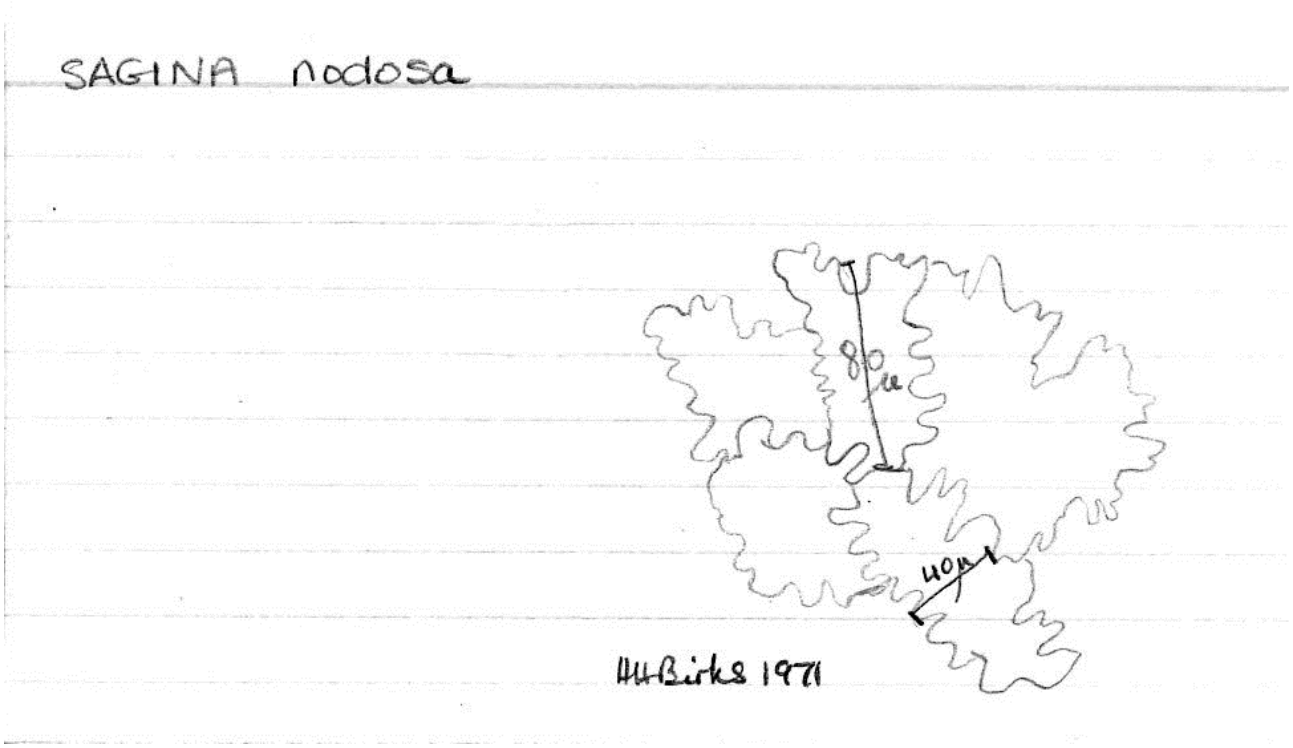


Minuartia stricta

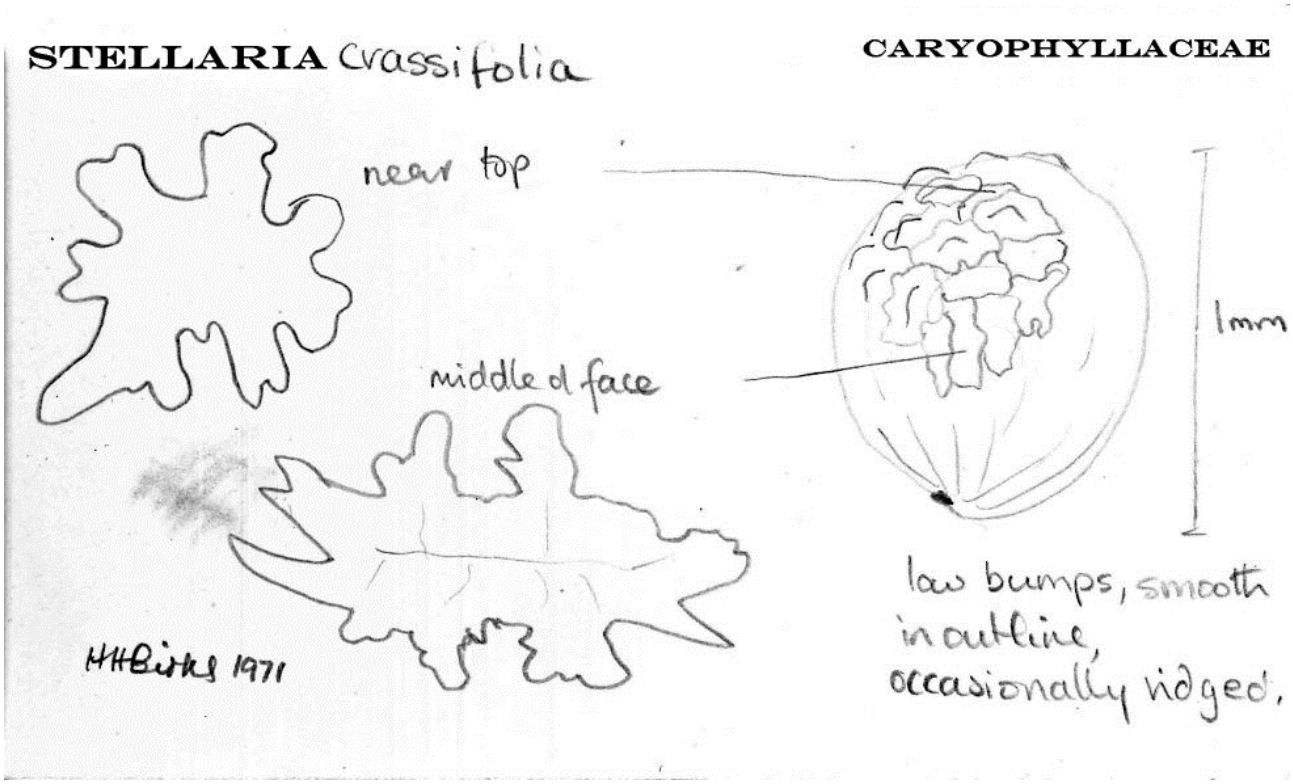
Sagina intermedia



Sagina nodosa

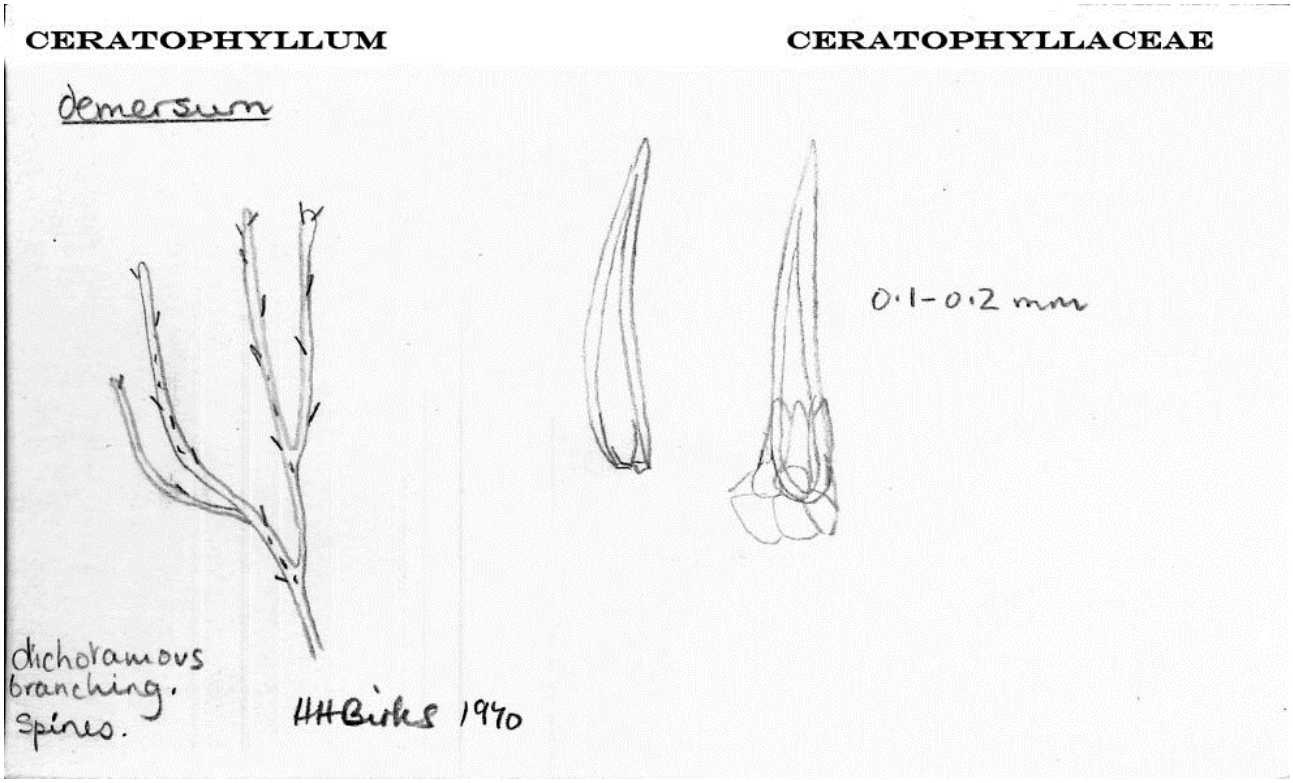


Stellaraia crassifolia



CERATOPHYLLACEAE

Ceratophyllum demersum

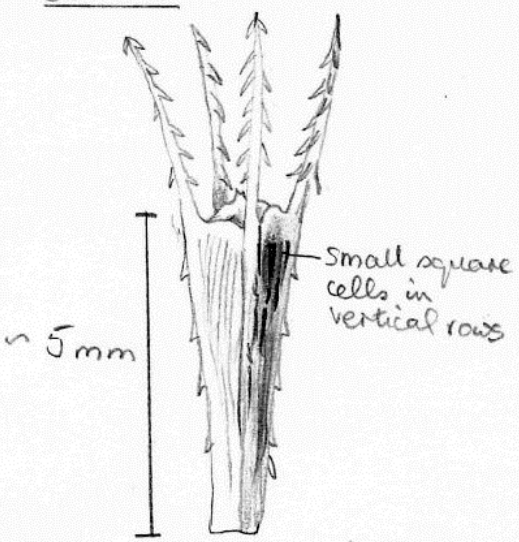


COMPOSITAE

Bidens cernua

BIDENS
cernua

COMPOSITAE



4 equal spines

HHGibbs 1970

PTO

B. comosa 3 spines. Or rarely, 2 long & 2 short

B. connata 3 or 4. 2 long & 1 or 2 short. Warty with hairs

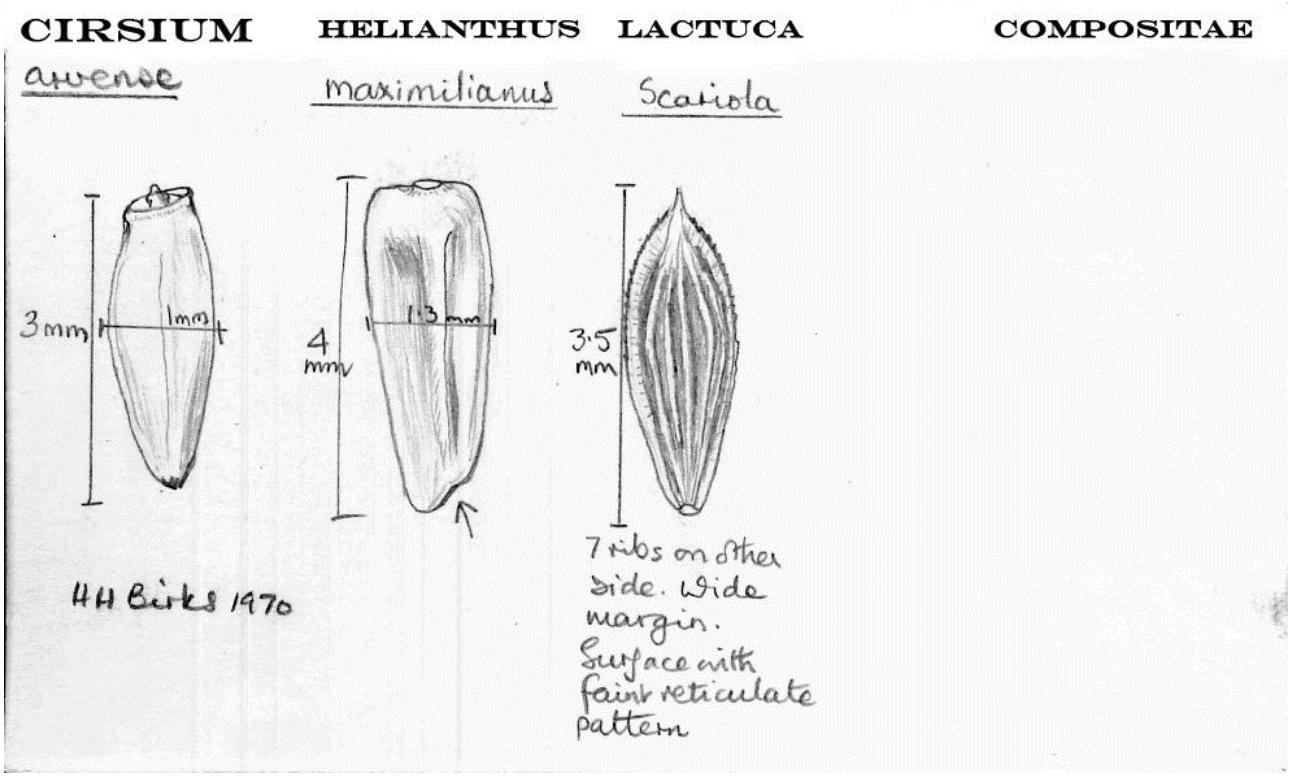
B. coronata. 2 spiny peaks at sides

B. discoidea 2. Hairy

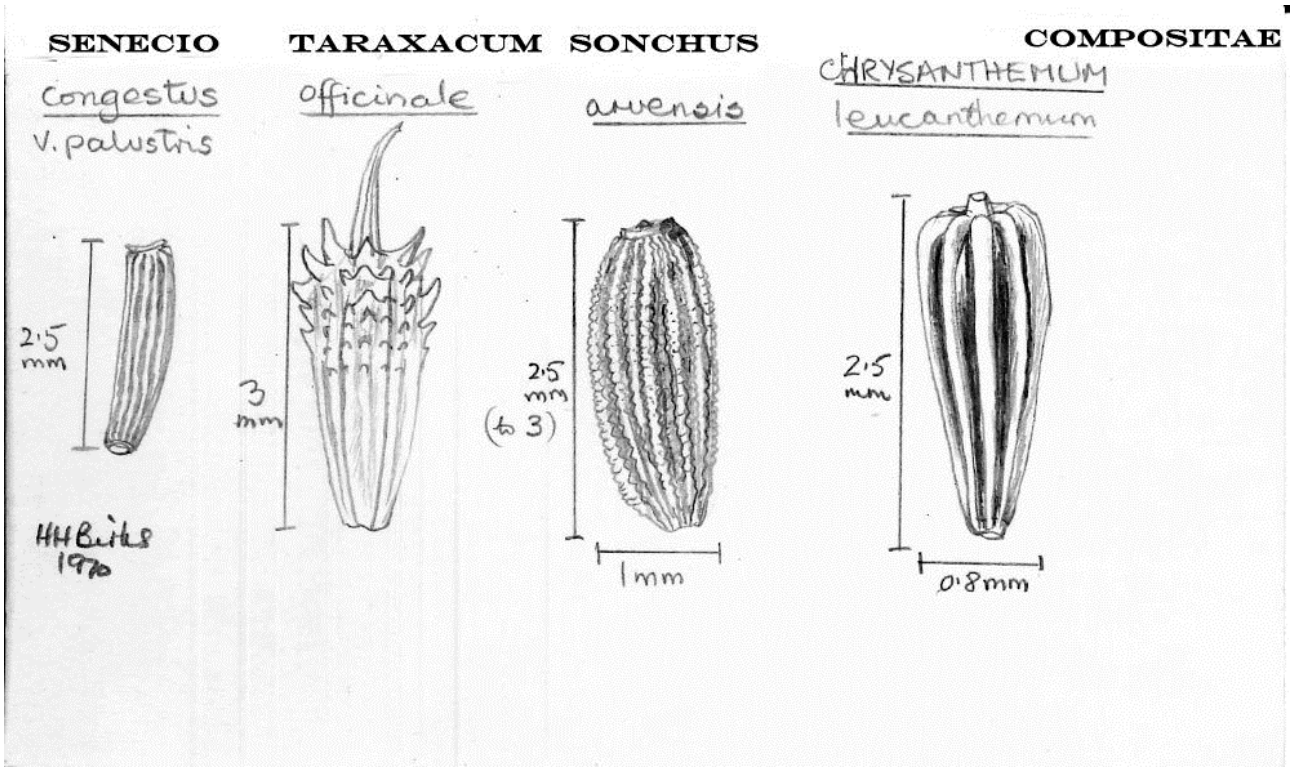
B. frondosa 2. Large warty fruit

B. vulgata 2. Large warty fruit

Cirsium arvense, Helianthus maximilianus, Lactuca scariola

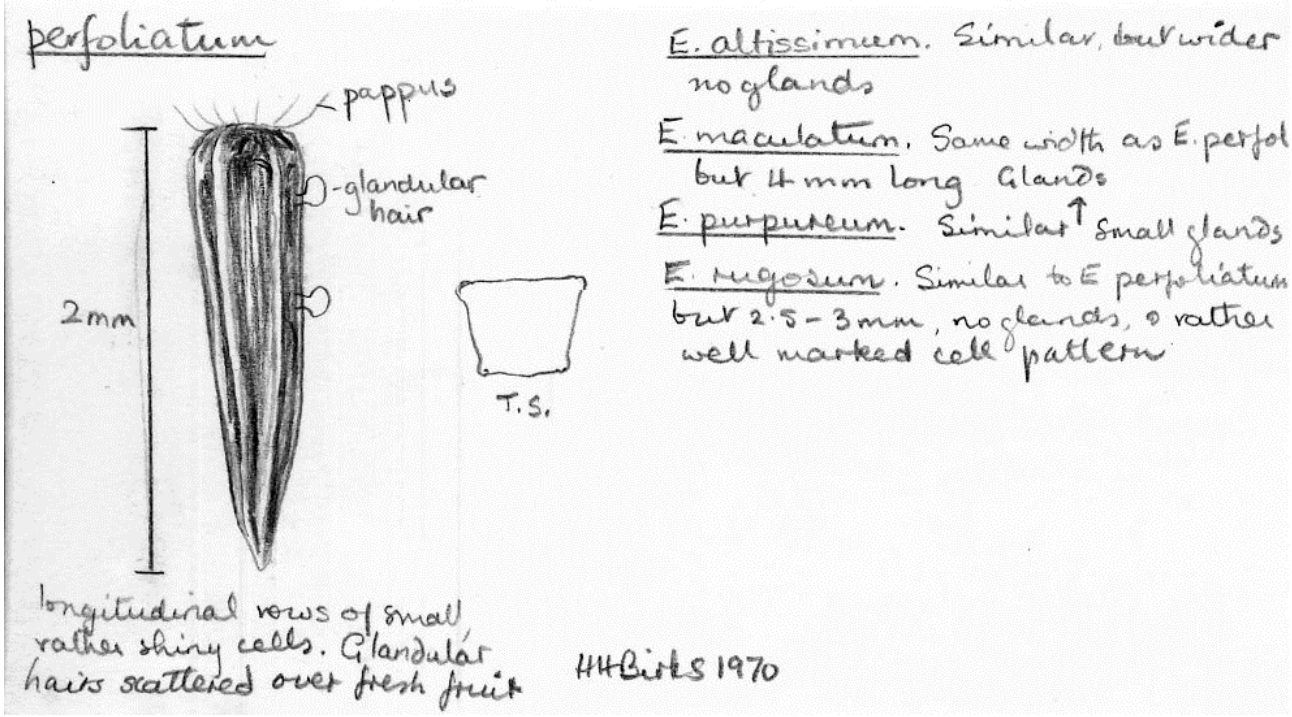


Senecio congestus* var. *palustris, Taraxacum officinale, Sonchus arvensis, Chrysanthemum lecuanthemum



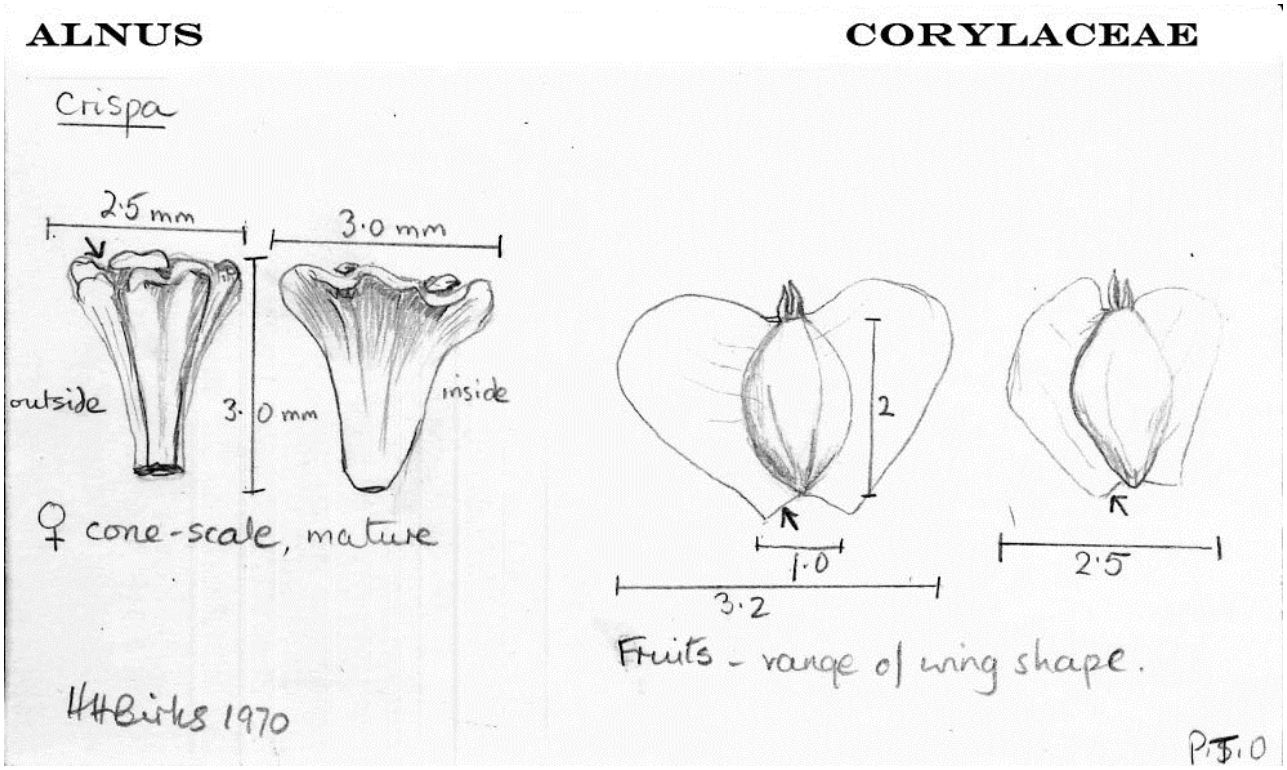
Eupatorium perfoliatum

EUPATORIUM **COMPOSITAE**

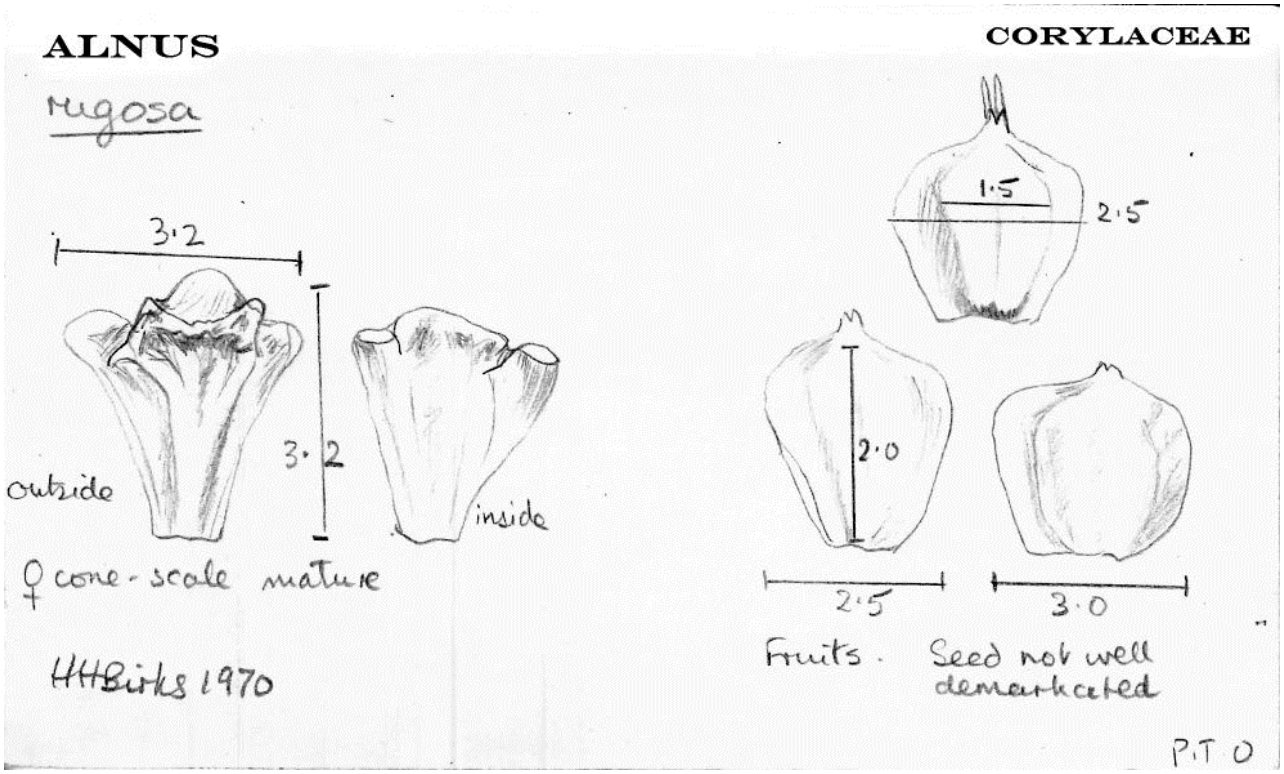


CORYLACEAE

Alnus crispa



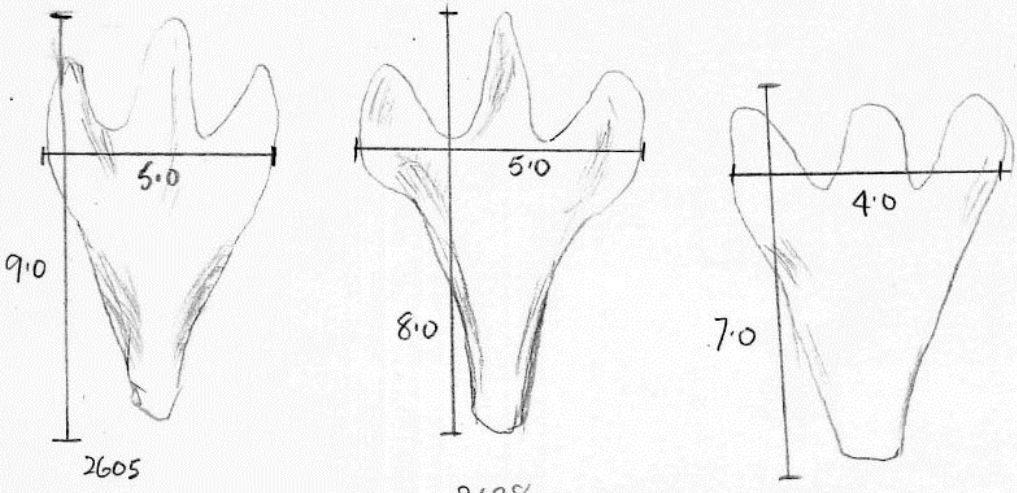
Alnus rugosa



Betula lutea

BETULA **CORYLACEAE**

lutea

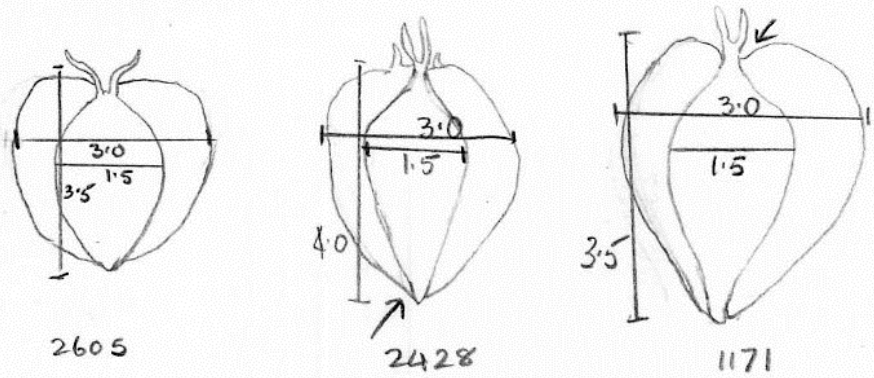


♀ cone-scales Relatively large, lobes ± equal in breadth PTO

HHBirks 1970

BETULA CORYLACEAE

lutea



fruits

Relatively narrow wings, joining above the top of the seed. PTO

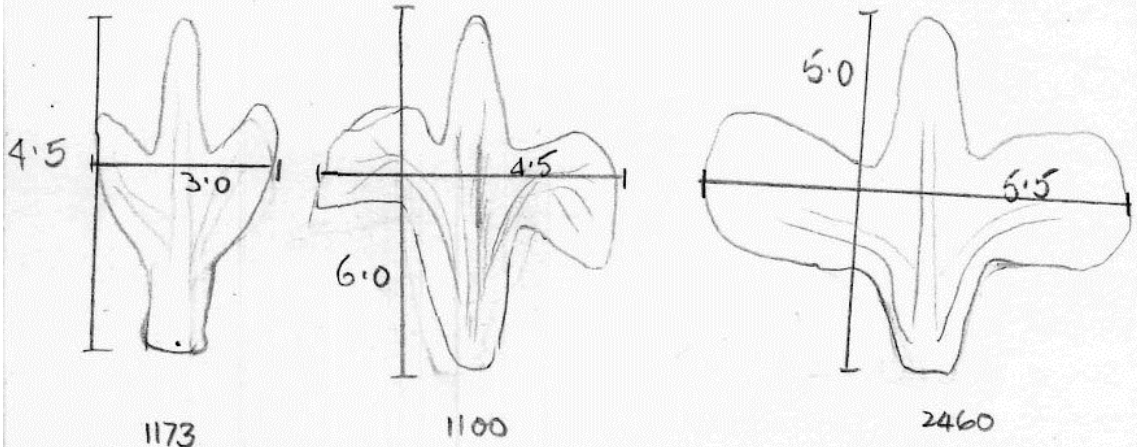
basal ∠ of fruit < 180°

HHBirks 1970

Betula papyrifera

BETULA **CORYLACEAE**

papyrifera



1173 1100 2460

3 collections

PTO

Constant feature is long narrow central lobe, and relatively wide spreading laterals.

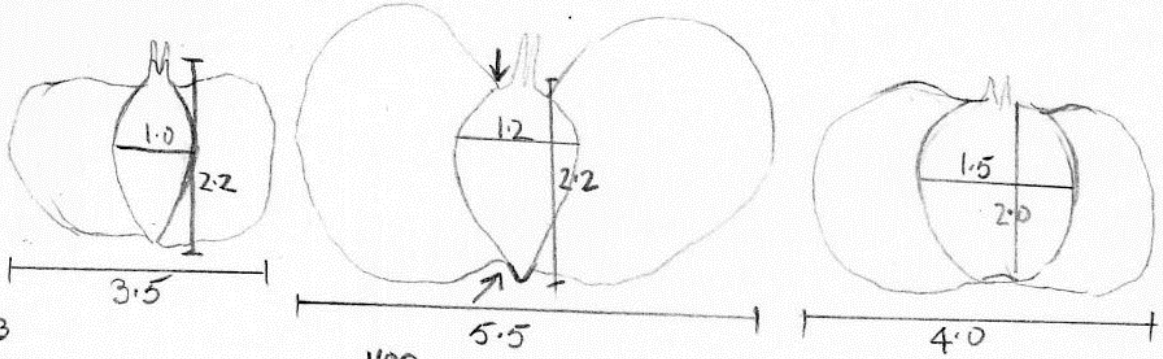
HHBirks 1970

CORYLACEAE

BETULA

papyrifera

fruits



1173 1100 2460

fruits

wide wings tending to join fruit on shoulder; ± flat at base

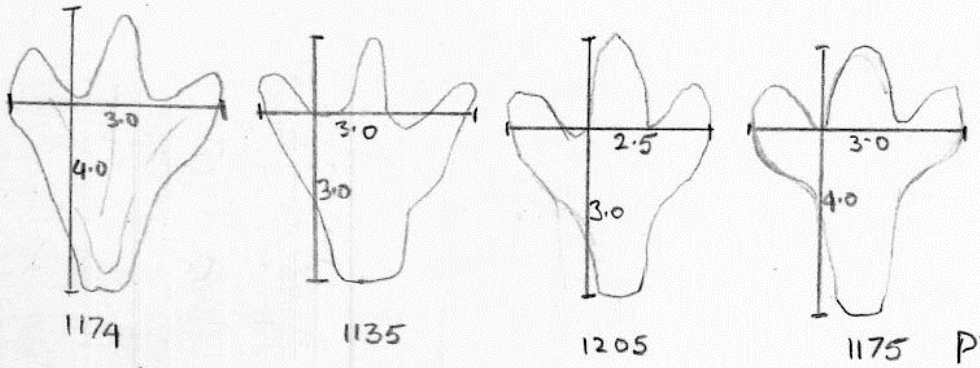
HHBirks 1970

PTO

Betula pumila* var. *glandulifera

BETULA **CORYLACEAE**

pumila var. glandulifera



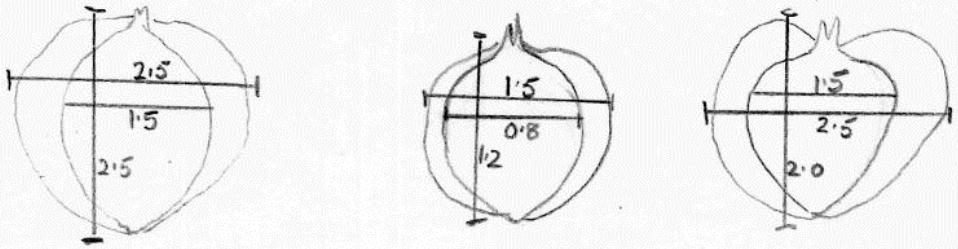
PTO

♀ Cone-scales
Relatively small

HHBirks 1970

BETULA **CORYLACEAE**

pumila var. glandulifera



fruits.

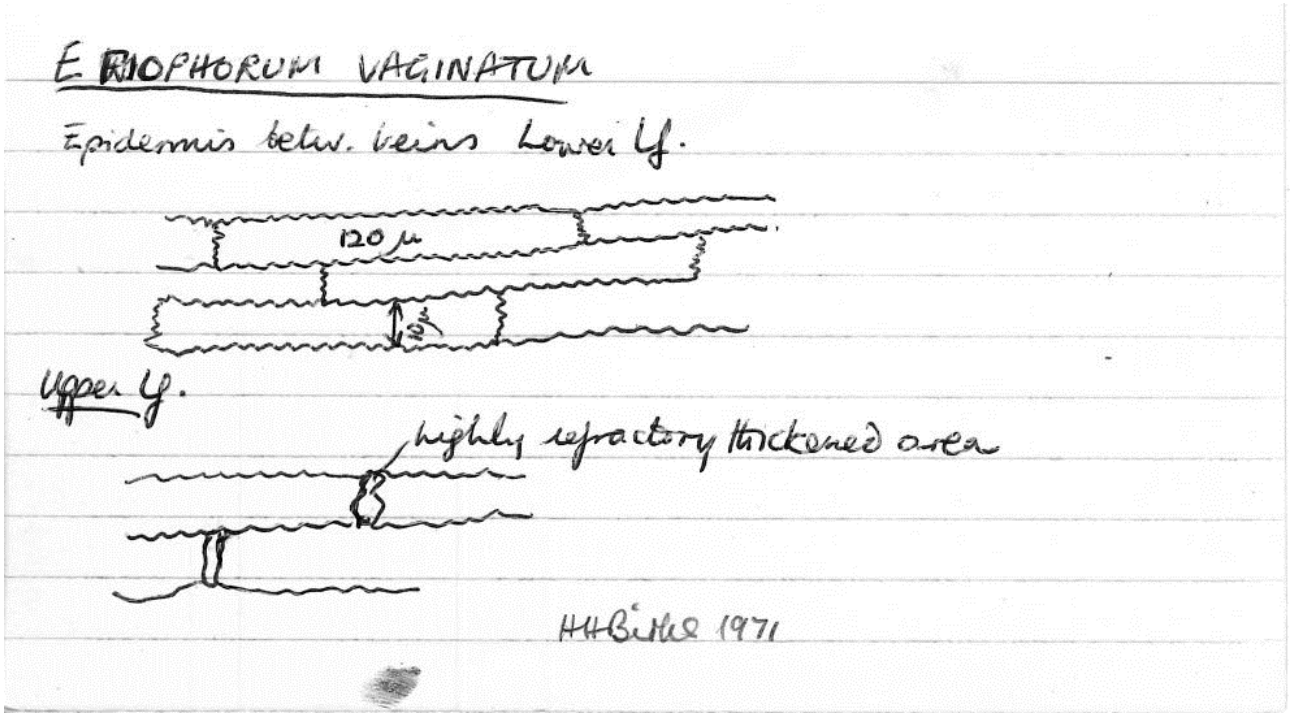
PTO

Tend to be wider than long. Wings less than ½ seed diam.

HHBirks 1970

CYPERACEAE

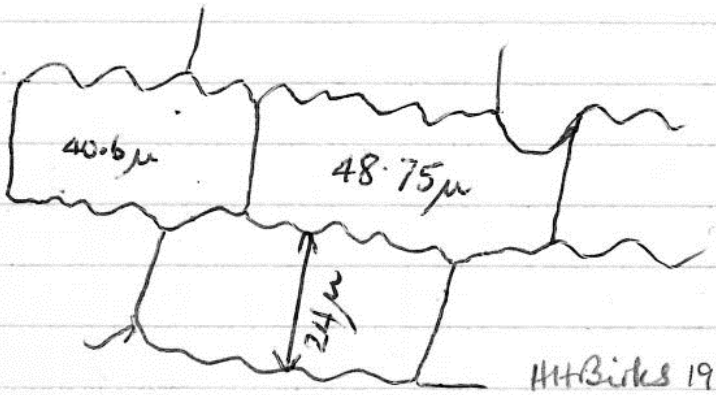
Eriophorum vaginatum



Trichophorum caespitosum

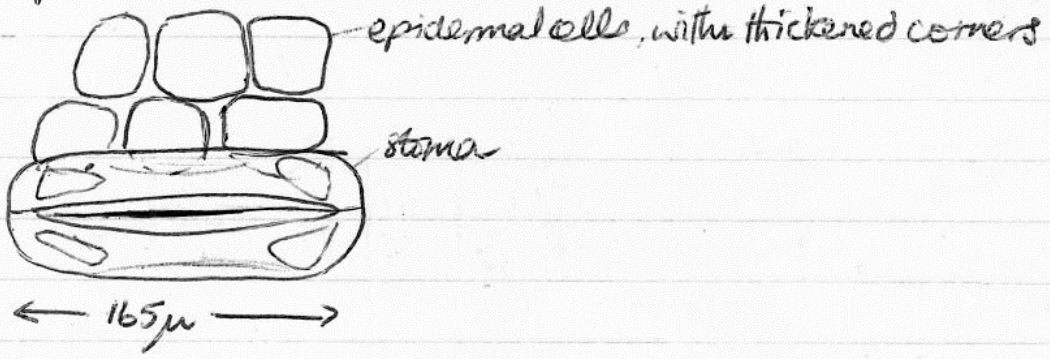
TRICHOPHORUM CAESPITOSUM

Epidermis of leaf base



HHBirks 1971 PTO

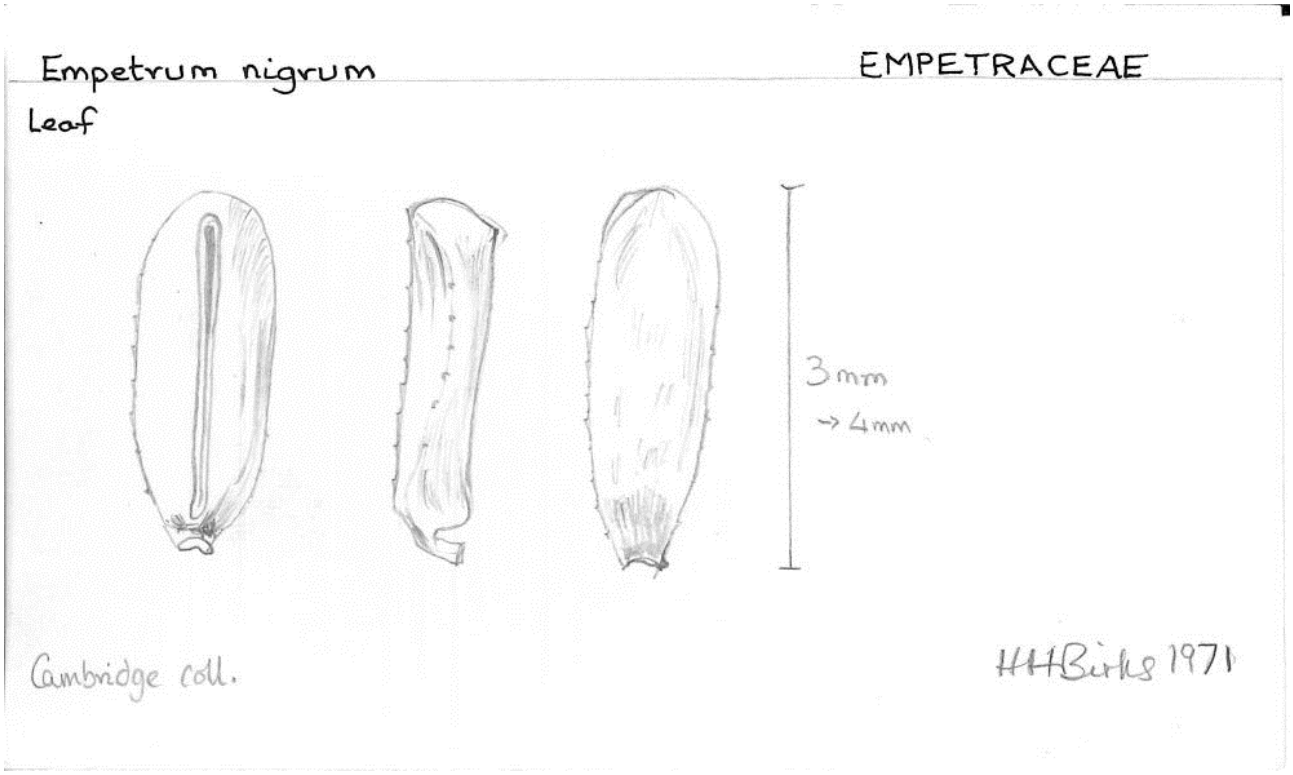
Leaf. Stomata in grooves between veins



HHBirks 1970

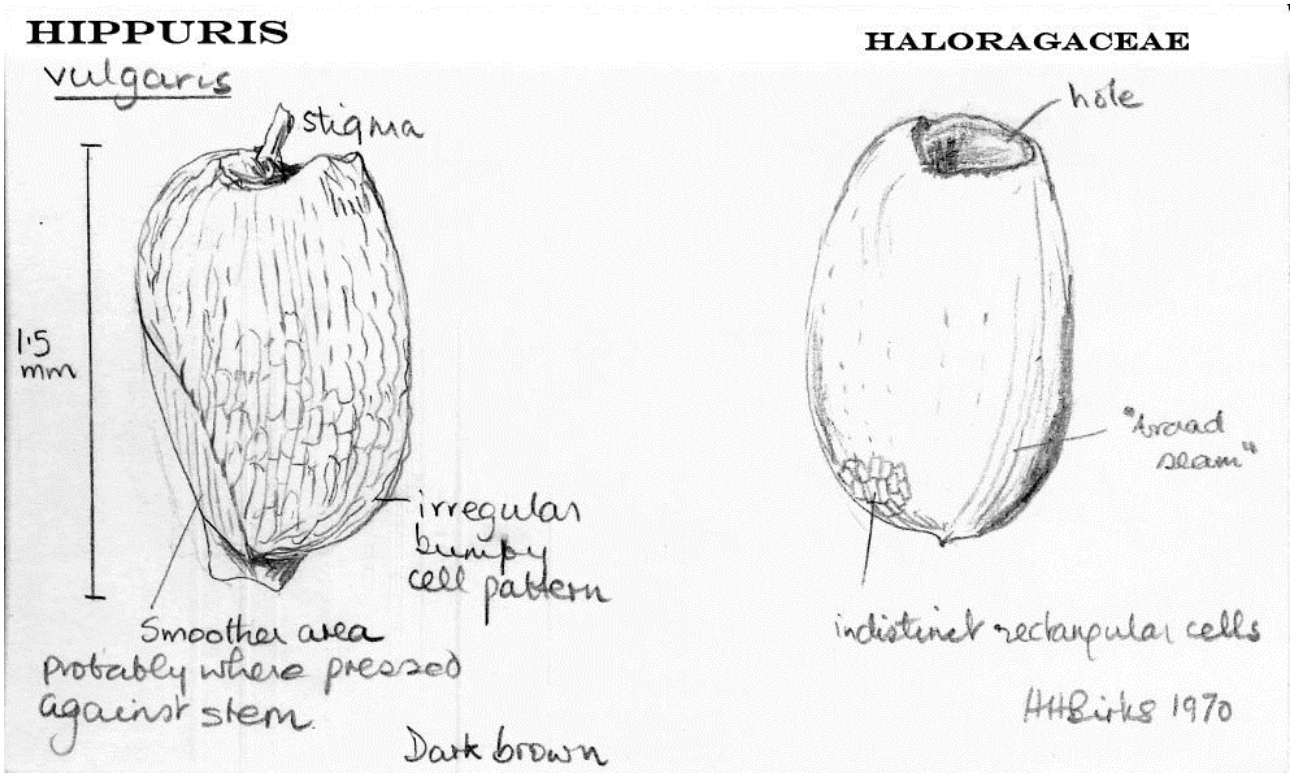
EMPETRACEAE

Empetrum nigrum



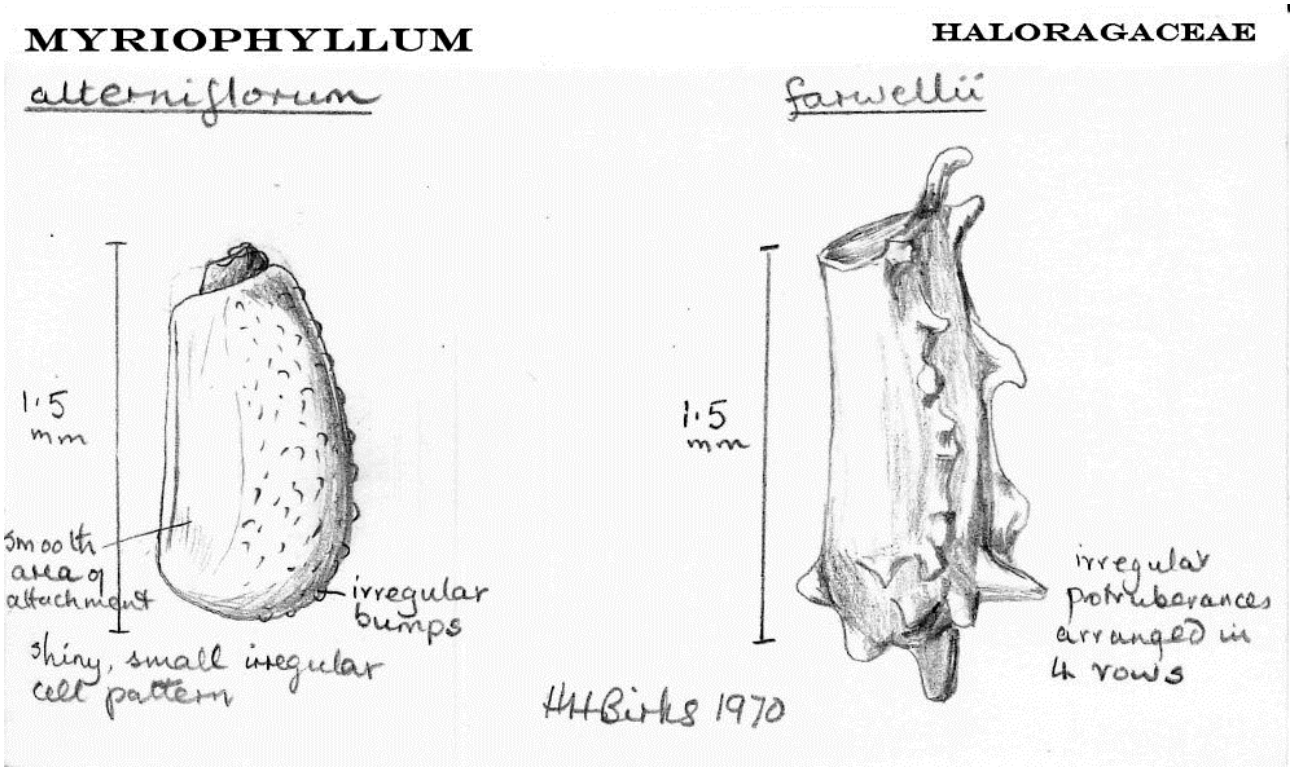
HALORAGACEAE

Hippuris vulgaris

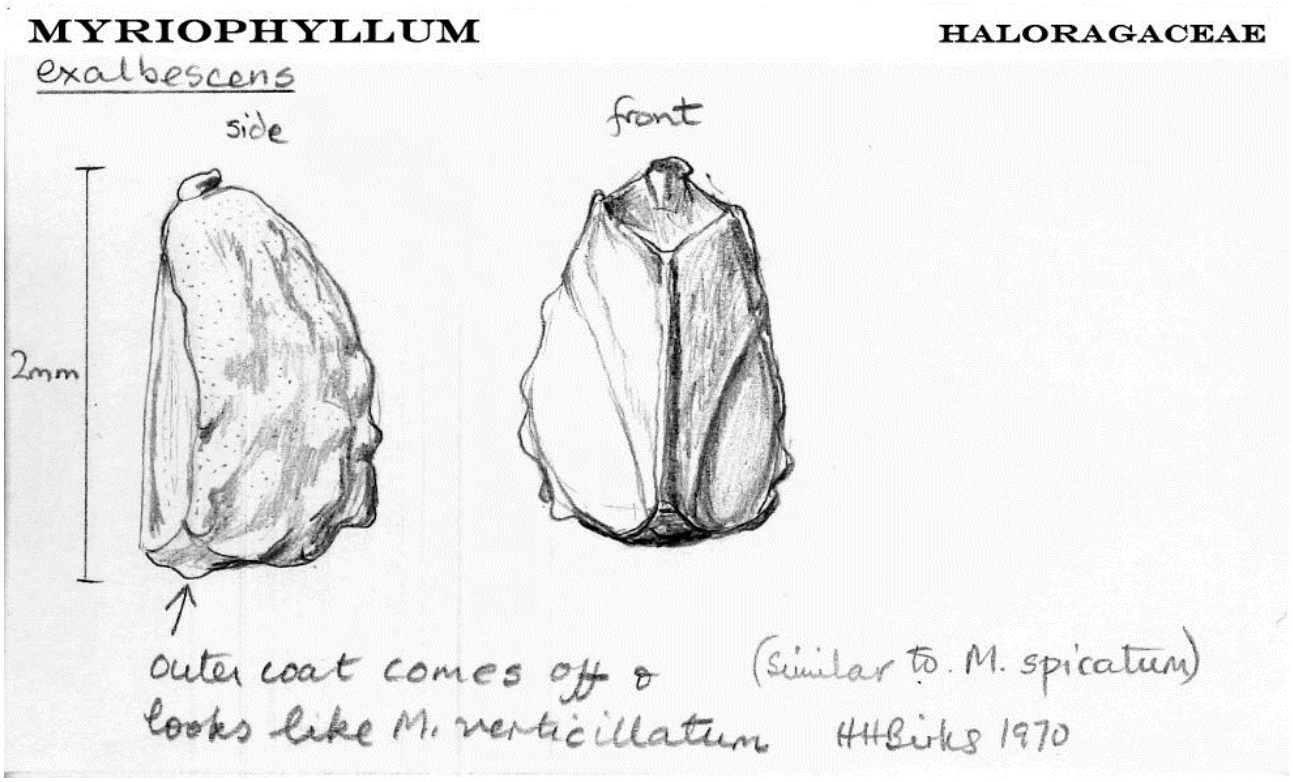


Myriophyllum

alterniflorum, farwellii

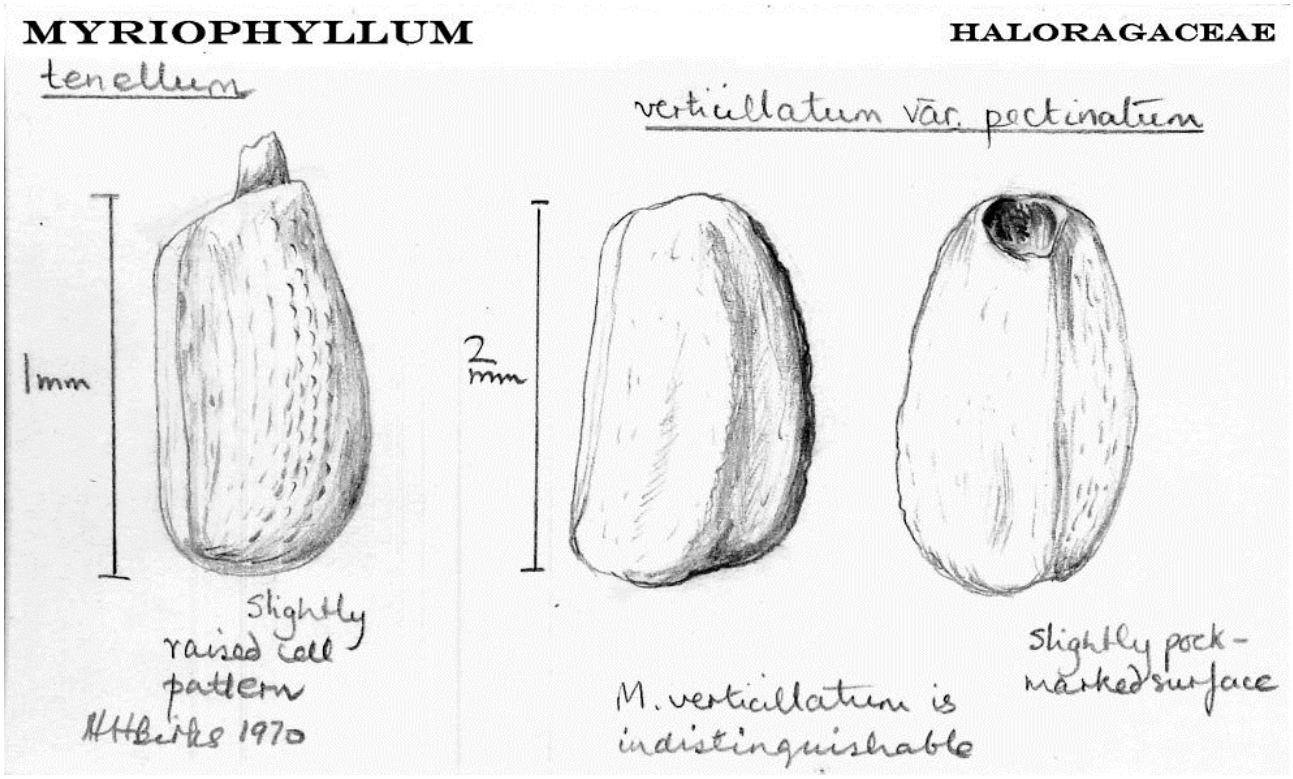


Myriophyllum exalbescens



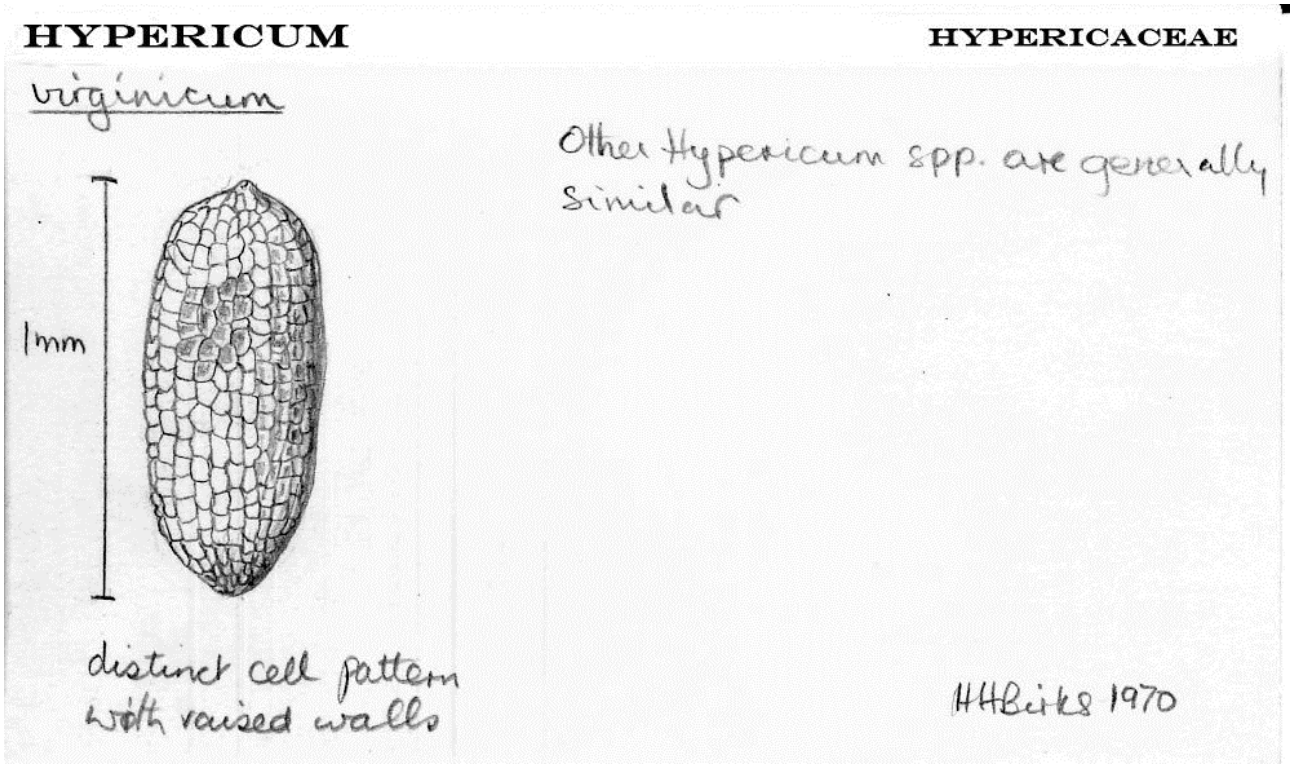
Myriophyllum

tennellum, verticillatum* var. *pectinatum



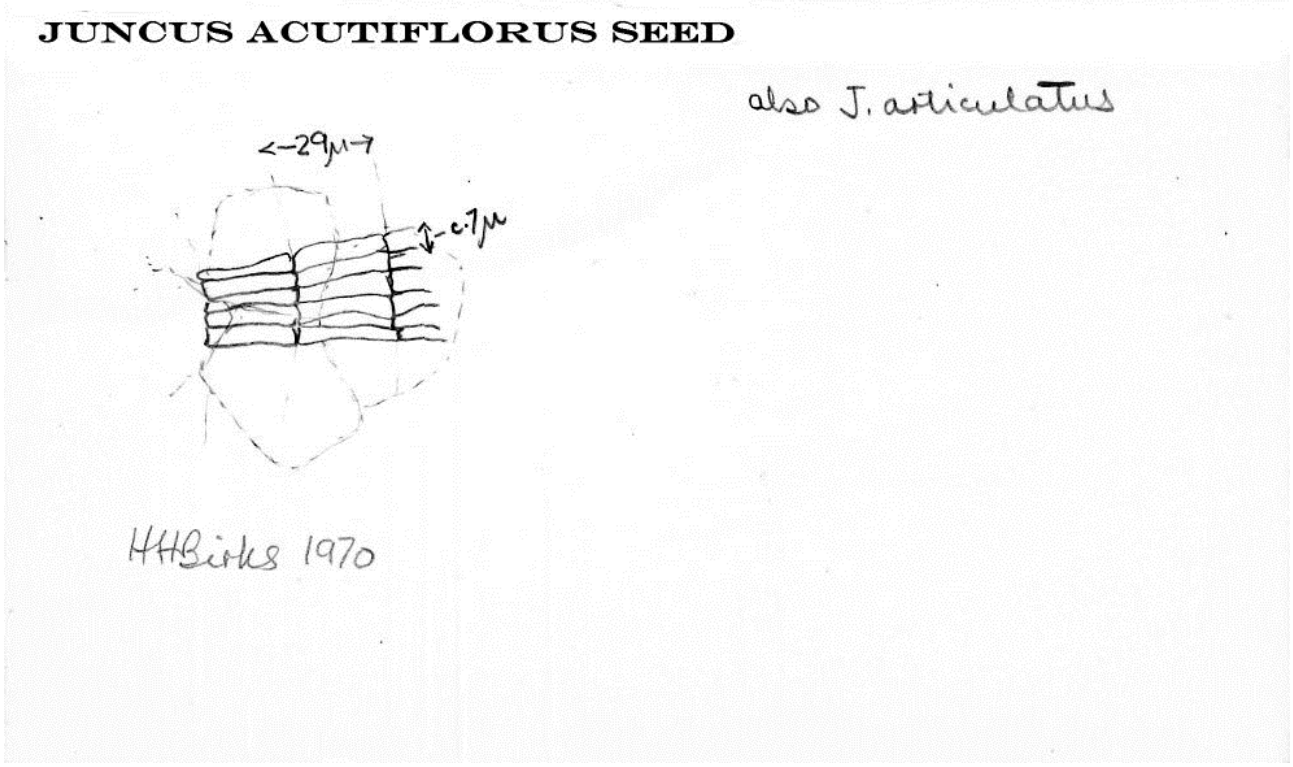
HYPERICACEAE

Hypericum virginicum

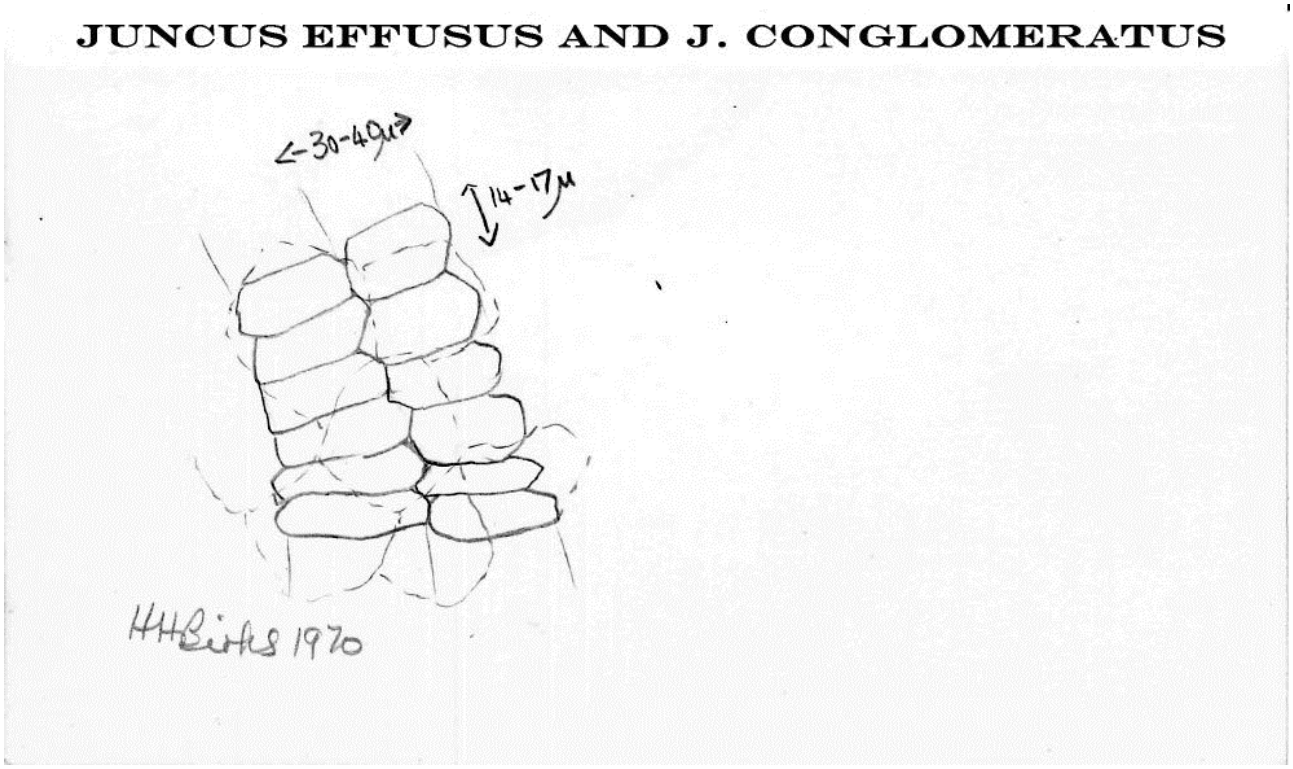


JUNCACEAE

Juncus acutiflorus

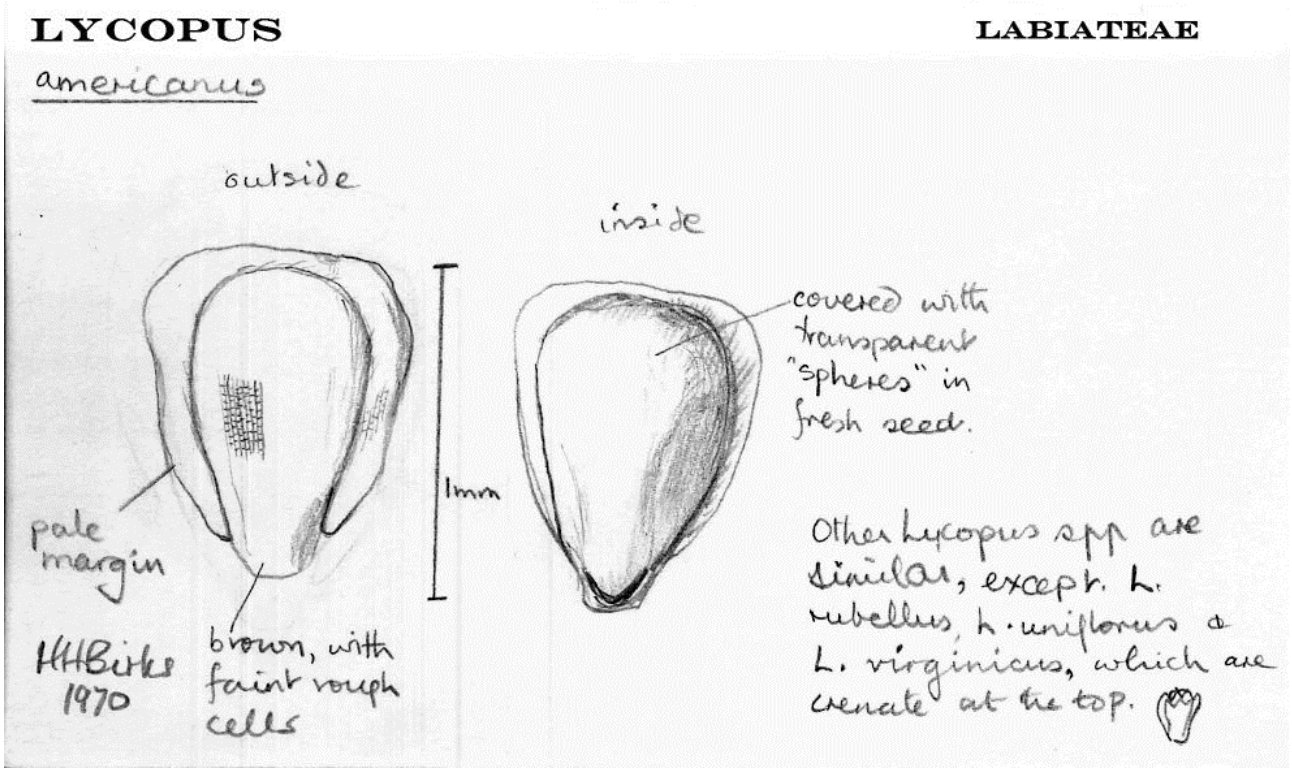


Juncus effusus* & *J. conglomeratus

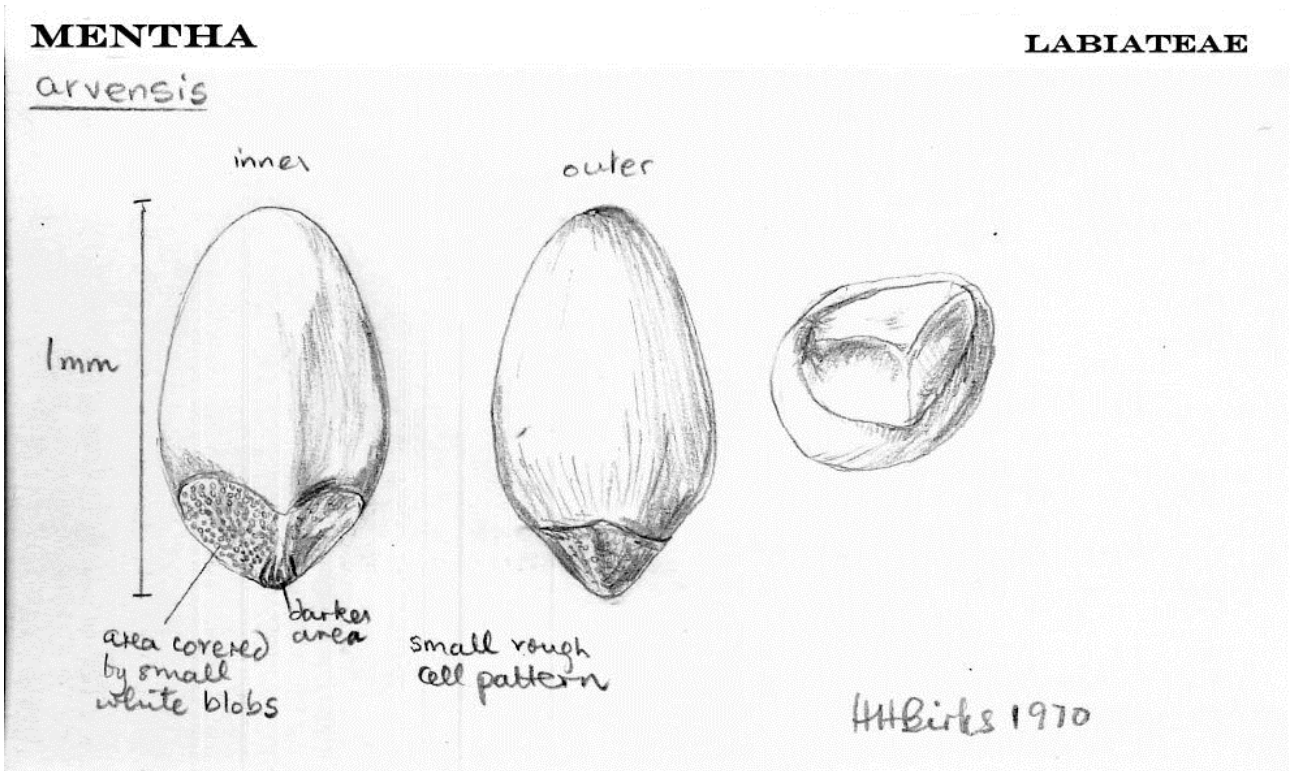


LABIATAE

Lycopus americanus

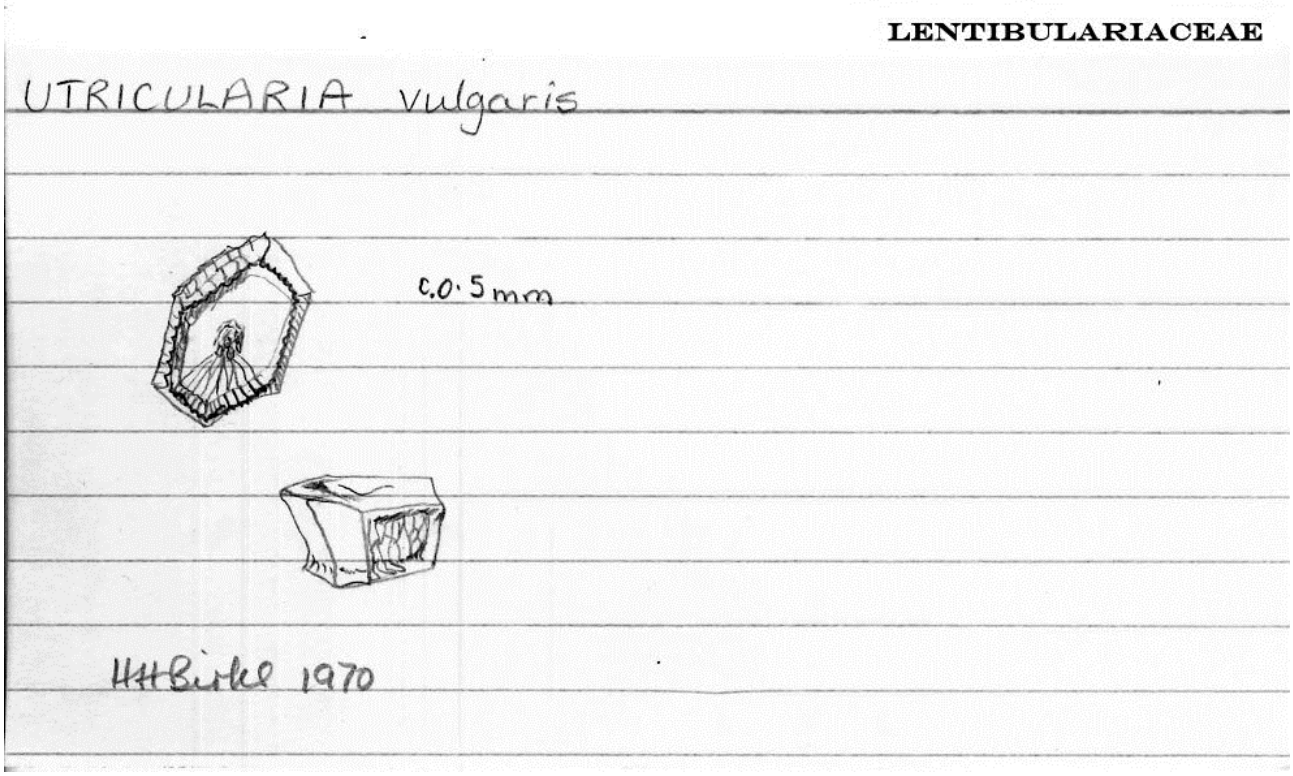


Mentha arvensis



LENTIBULARIACEAE

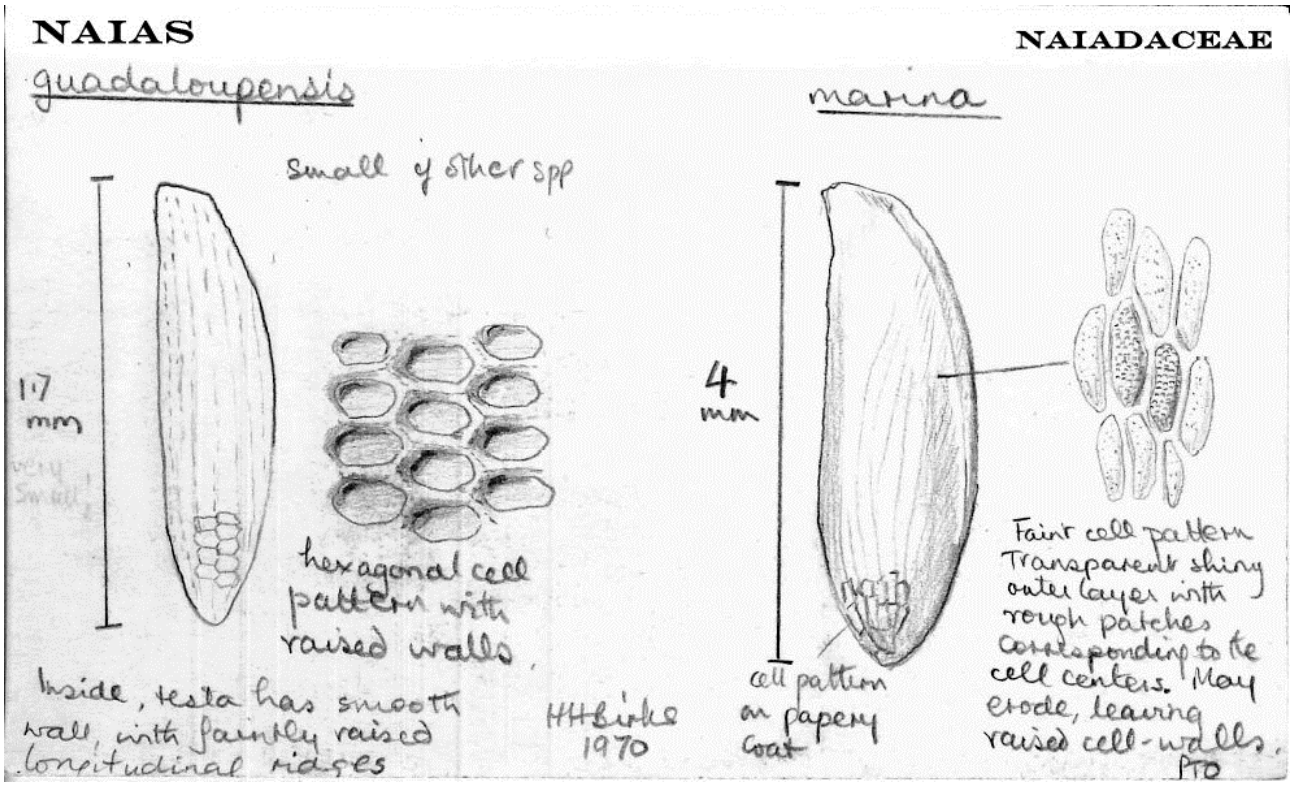
Utricularia vulgaris



NAIADACEAE

Najas

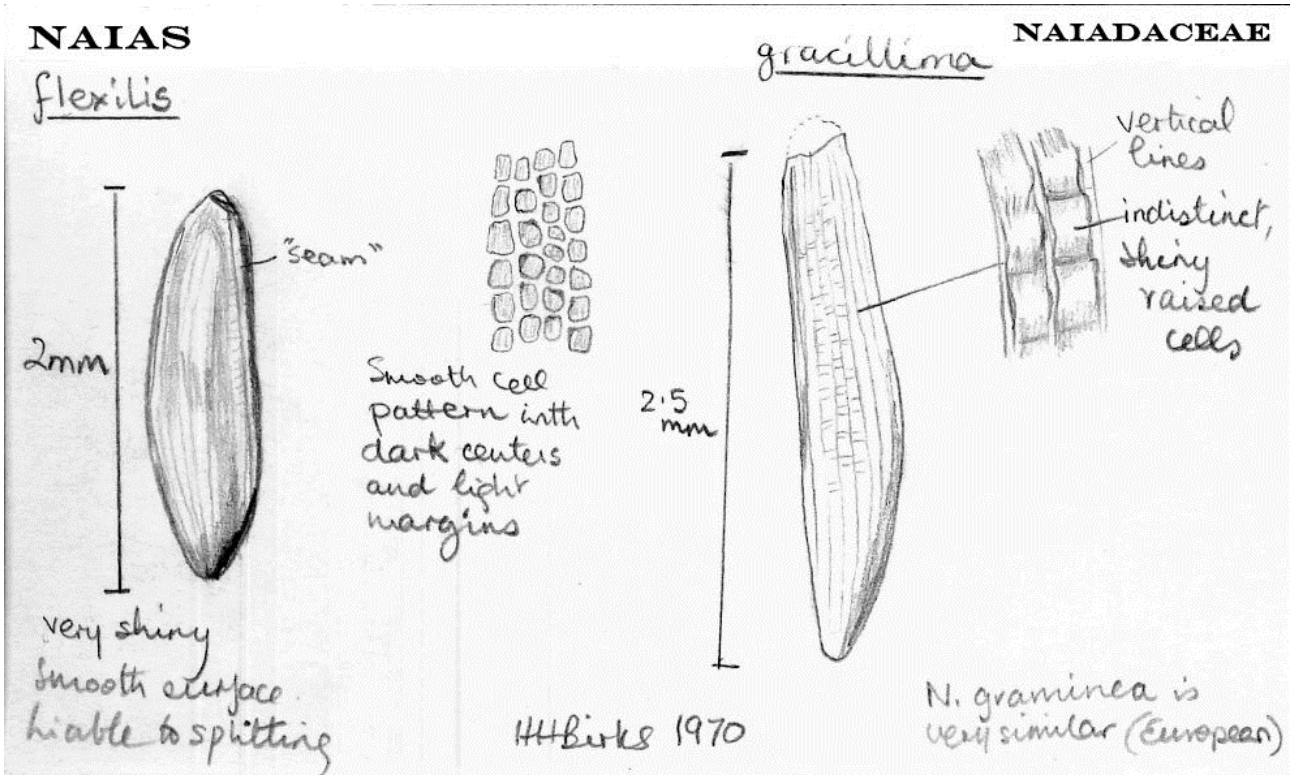
guadaloupensis, marina



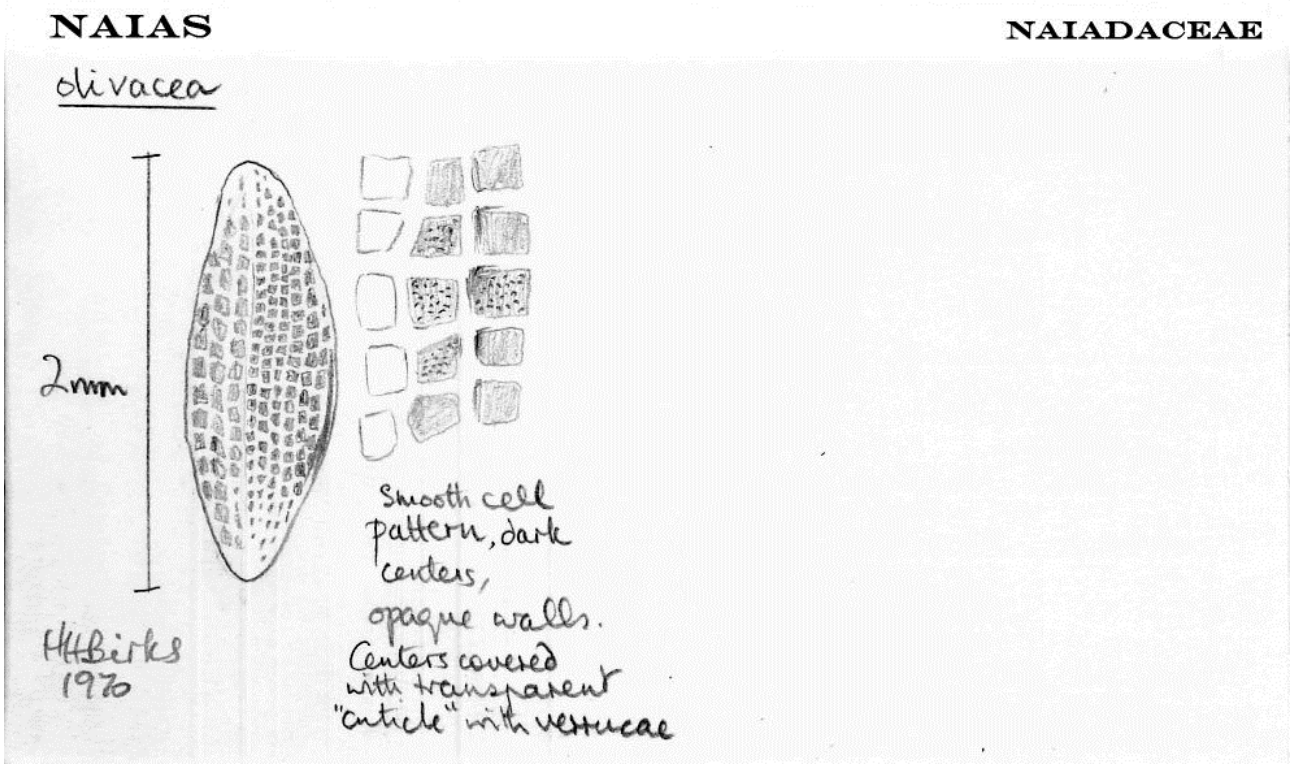
Seed testa has well marked ridge-like cells

Najas

flexilis, gracillima

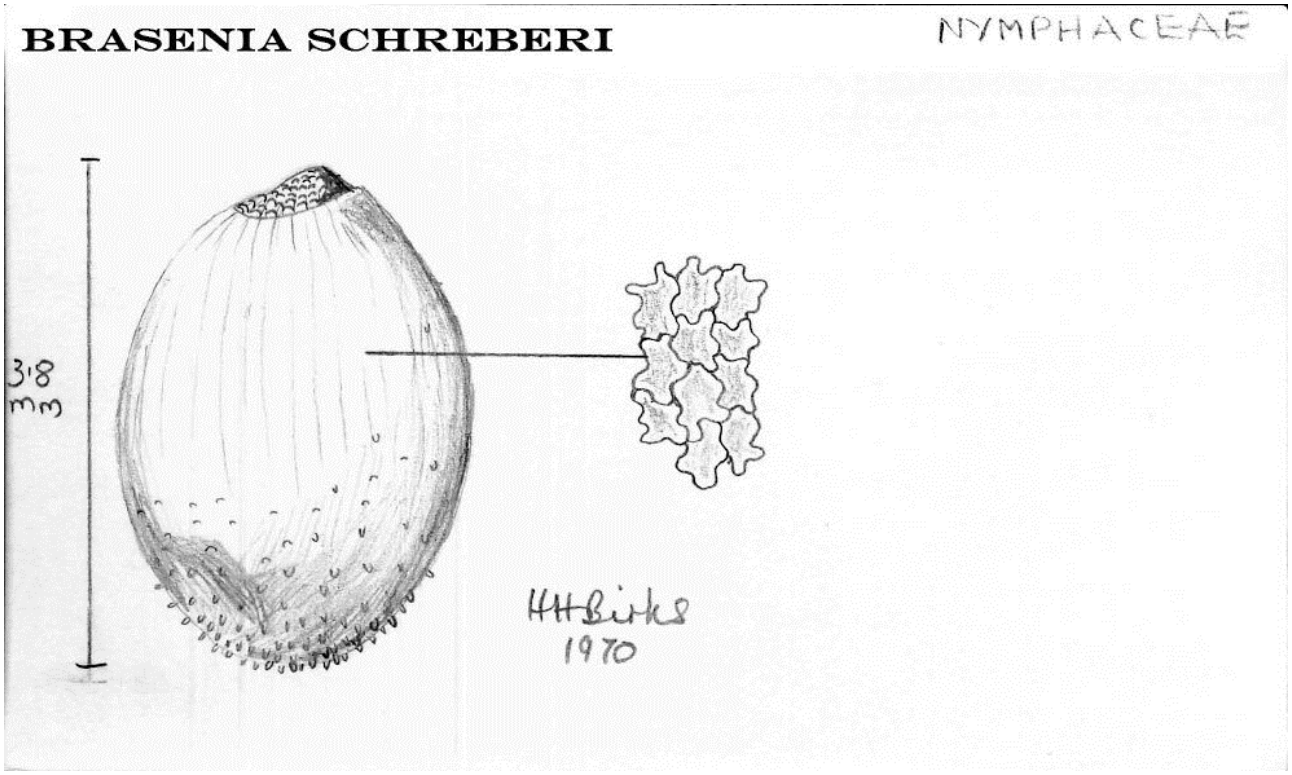


Najas olivacea

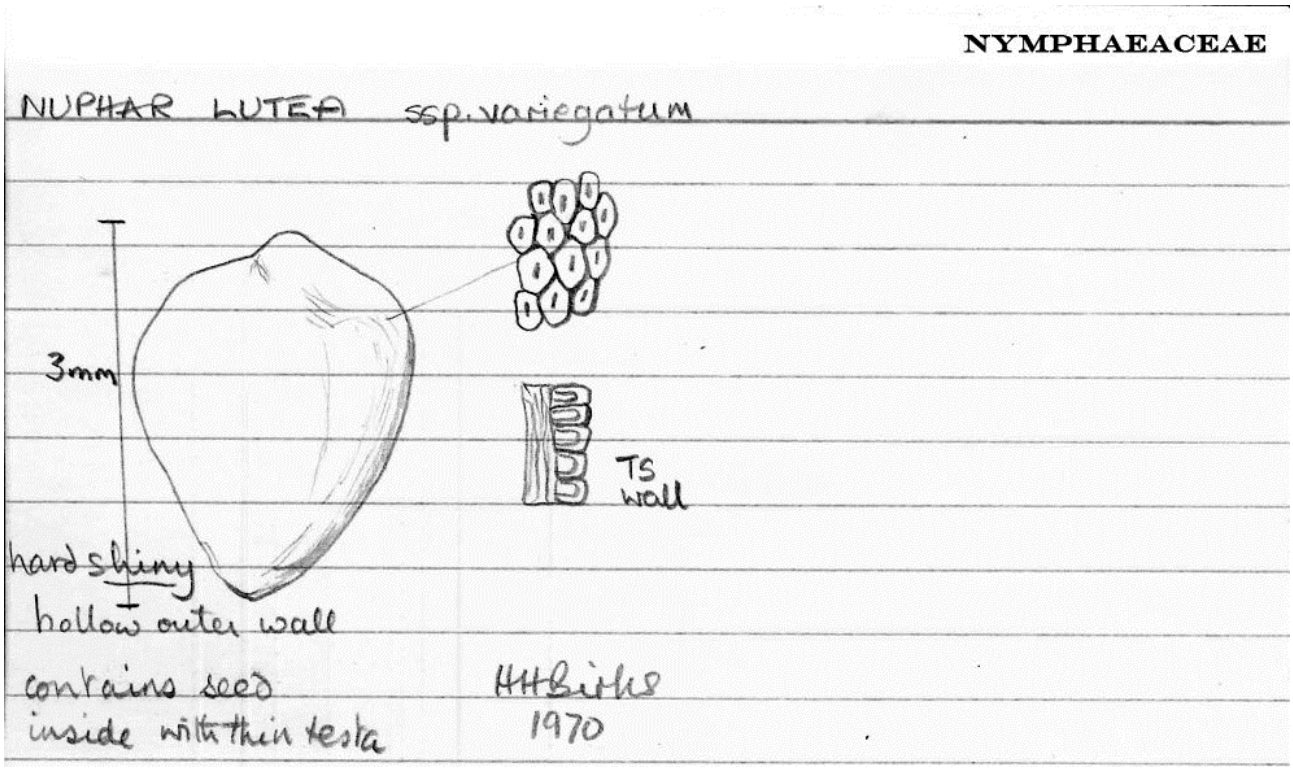


NYMPHAEACEAE

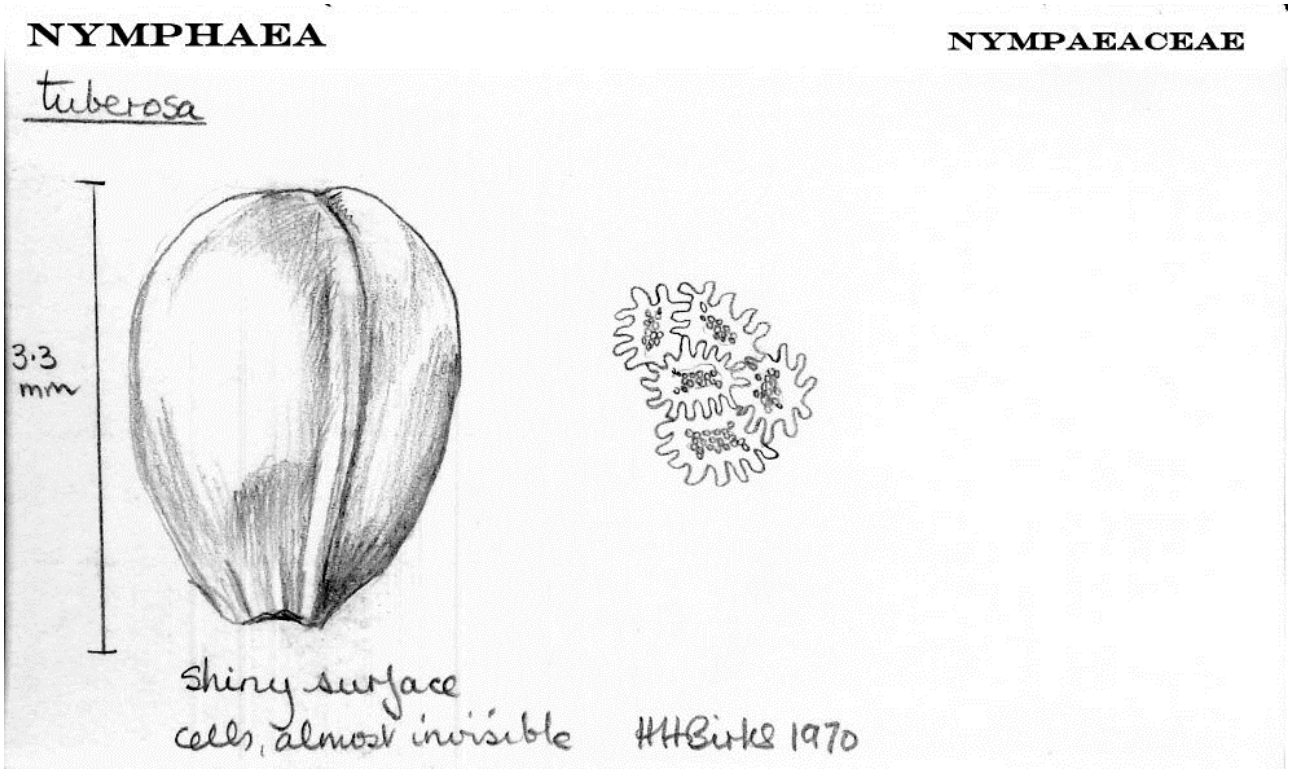
Brasenia schreberi



Nuphar lutea* ssp. *variegatum



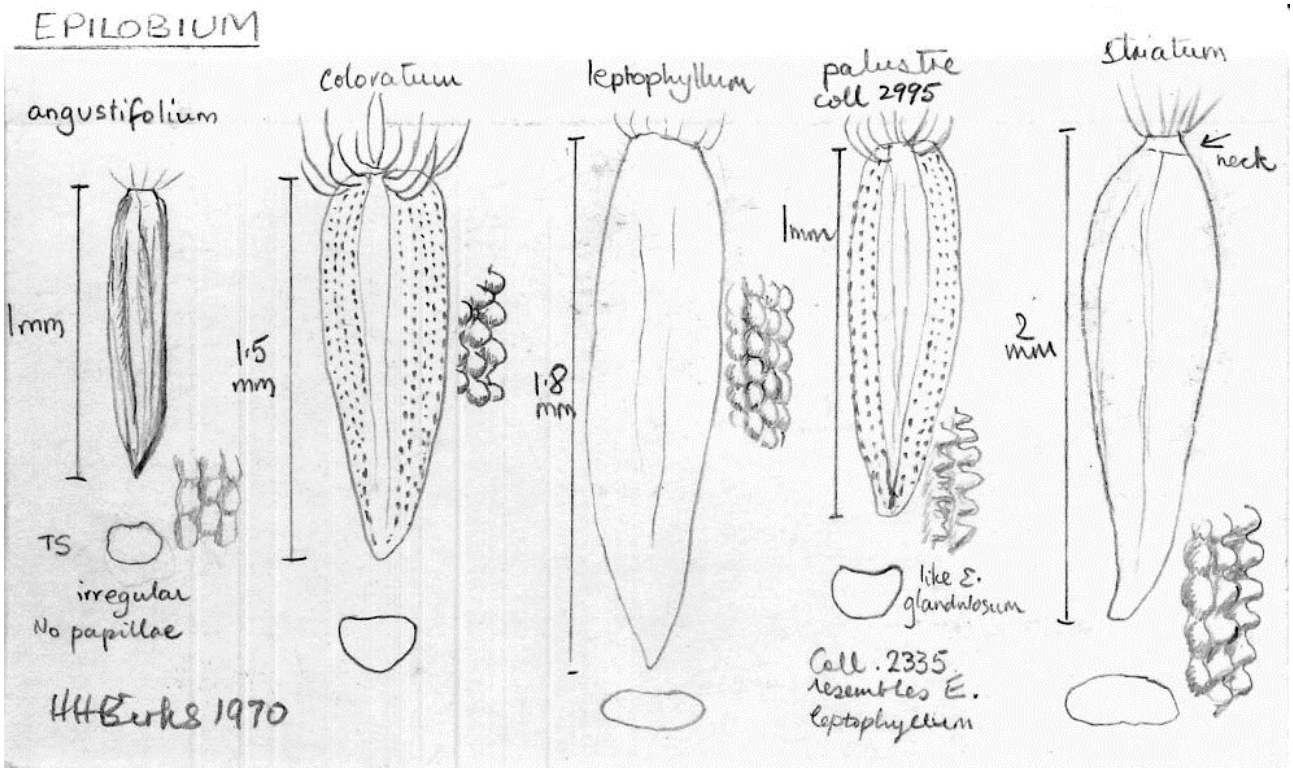
Nymphaea tuberosa



ONAGRACEAE

Epilobium

angustifolium, coloratum, leptophyllum, palustre, strictum



E. angustifolium. Similar size to E. glandulosum, but seeds in coll immature. No papillae

E. coloratum 1·3 - 1·5 mm. Papillae not so long, & rounded, and regularly arranged but not in rows. Like var. adenocaulon.

E. leptophyllum 1·8 mm Protruding cells ~~~. Rather flattened, but may be poorly developed

E. palustre 1·5 mm. Like E. leptophyllum. Flattened

E. strictum 1·5 - 2 mm. Like E. palustre

2 main types: 1) symmetrical on both sides 2) one side with "seam"

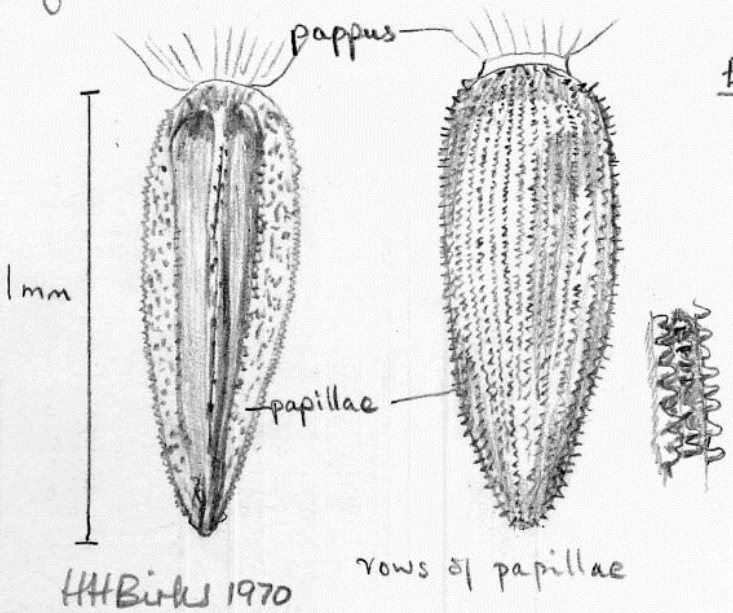
E. angustifolium
E. leptophyllum
E. strictum
E. palustre pp.

E. glandulosum
E. coloratum
E. palustre p.p.

Epilobium glandulosum

EPILOBIUM **ONAGRACEAE**

glandulosum



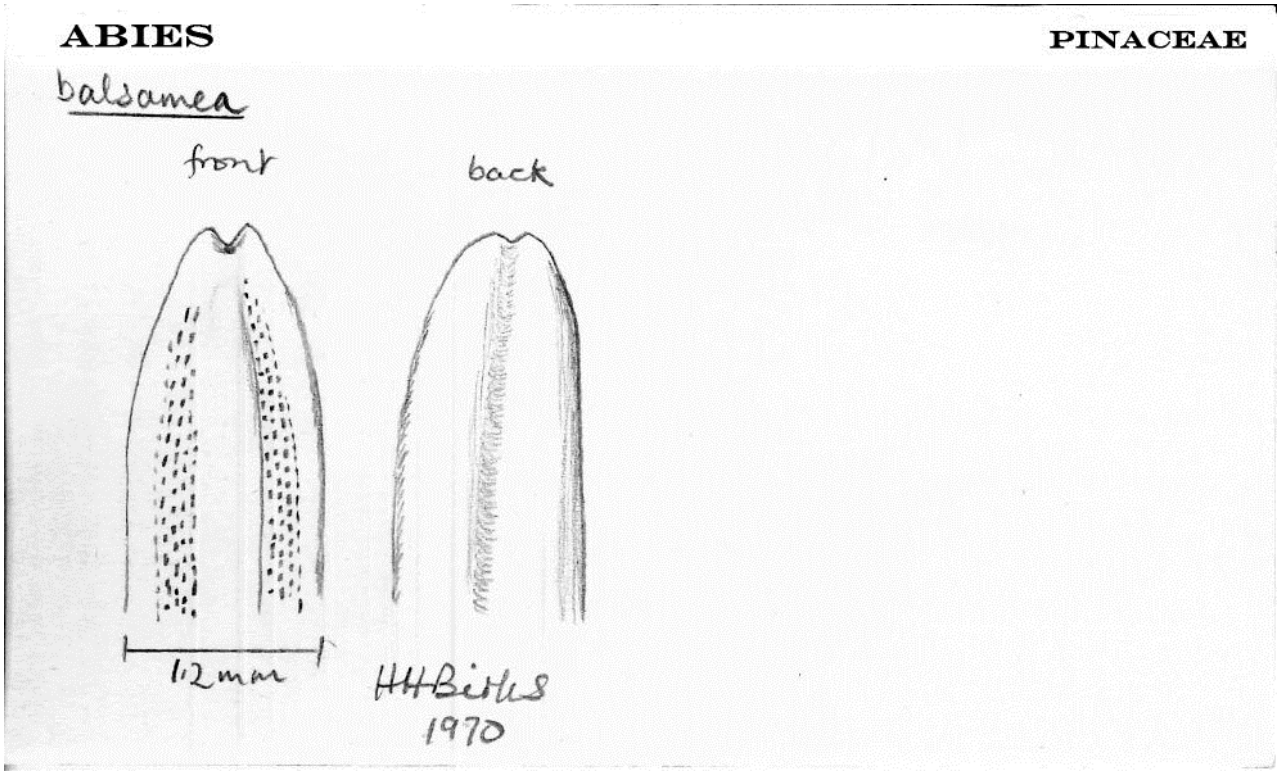
HHBirks 1970

E. glandulosum var adenocaulon
1·3 - 1·5 mm, larger, rounded papillae not forming discrete rows, but regularly arranged.

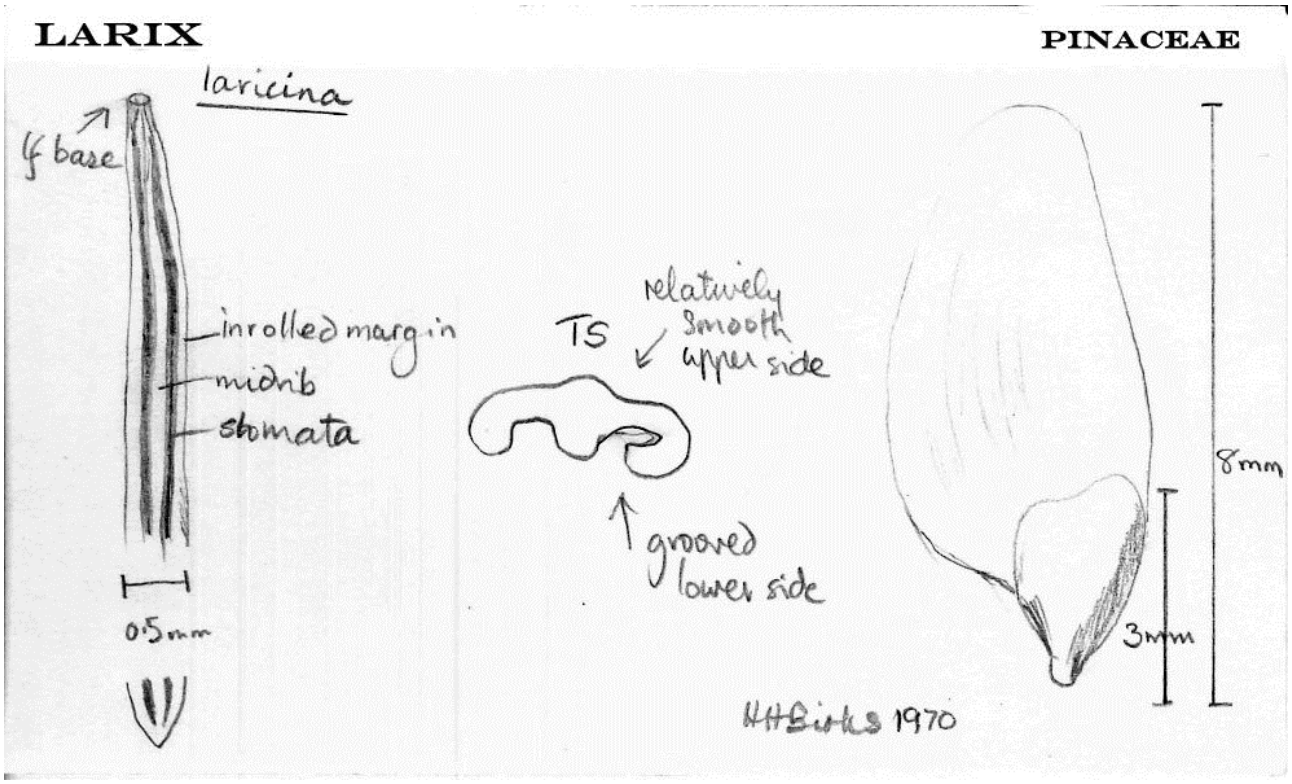
PTO

PINACEAE

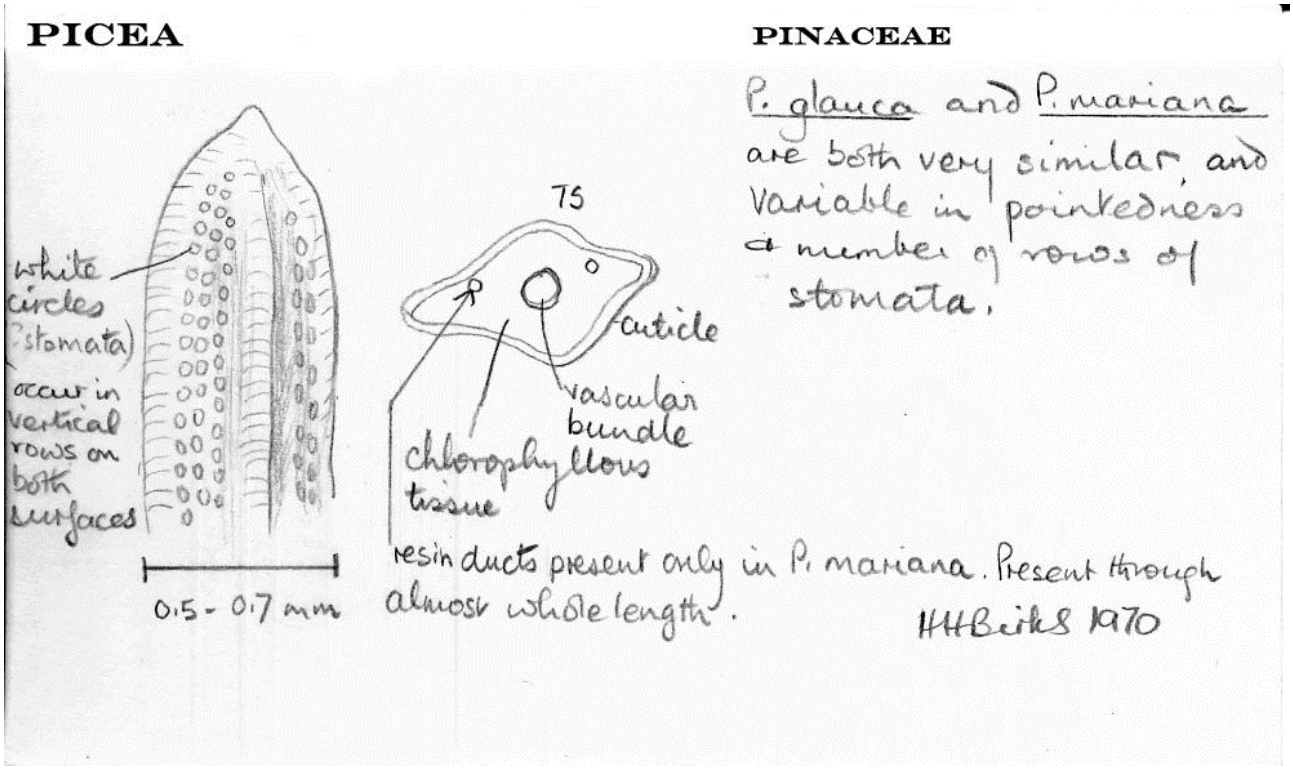
Abies balsamea



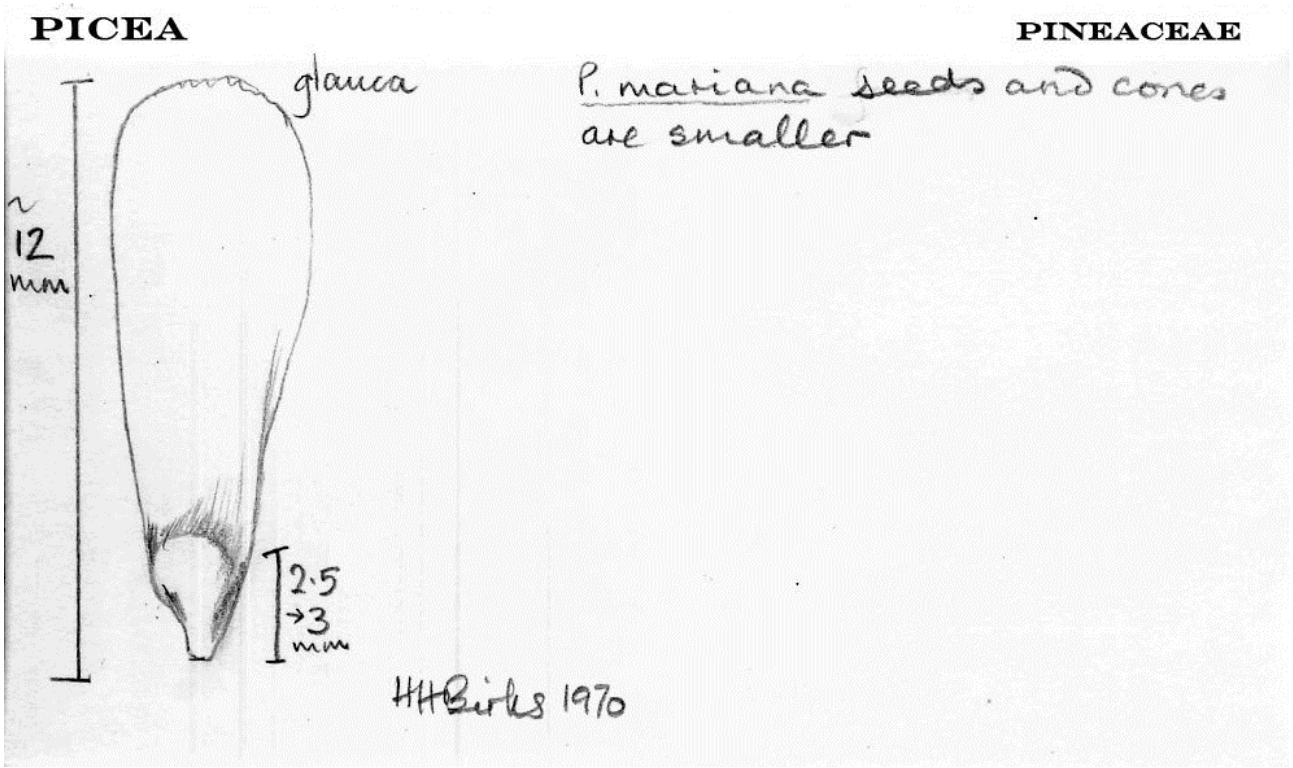
Larix laricina



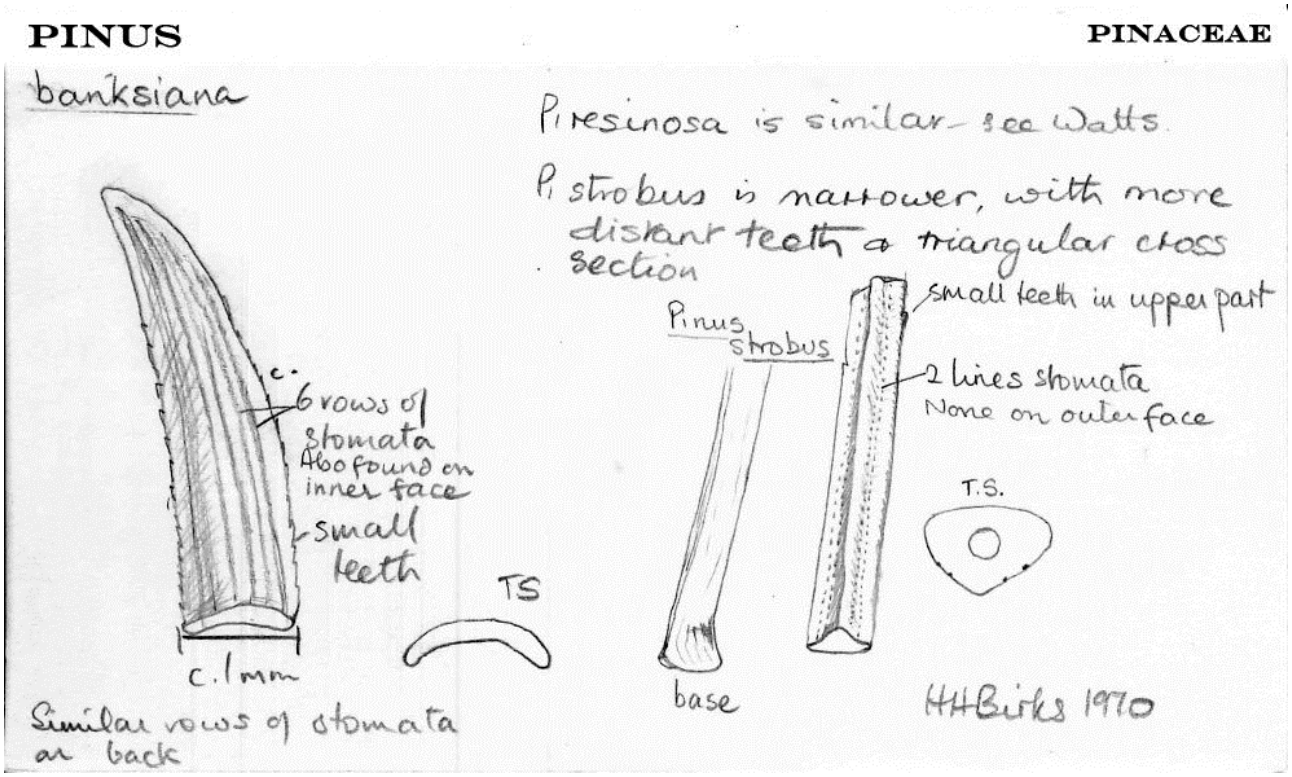
Picea



Picea glauca

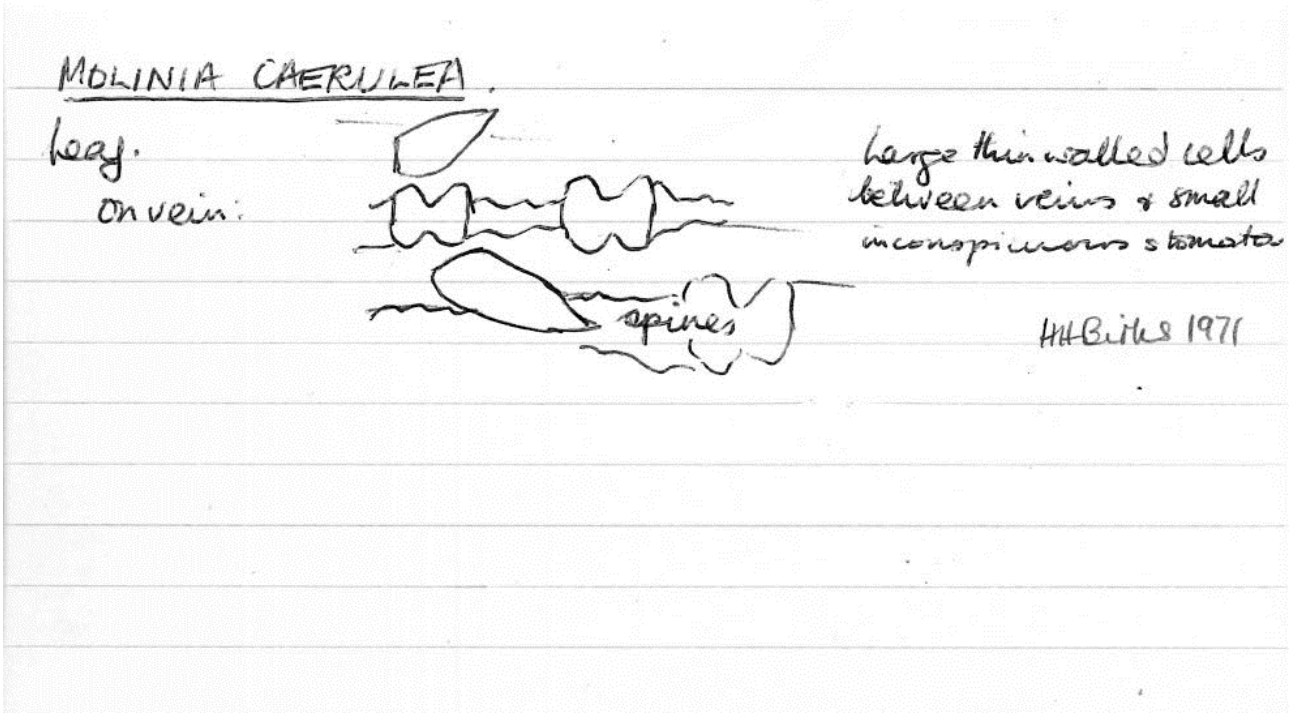


Pinus banksiana



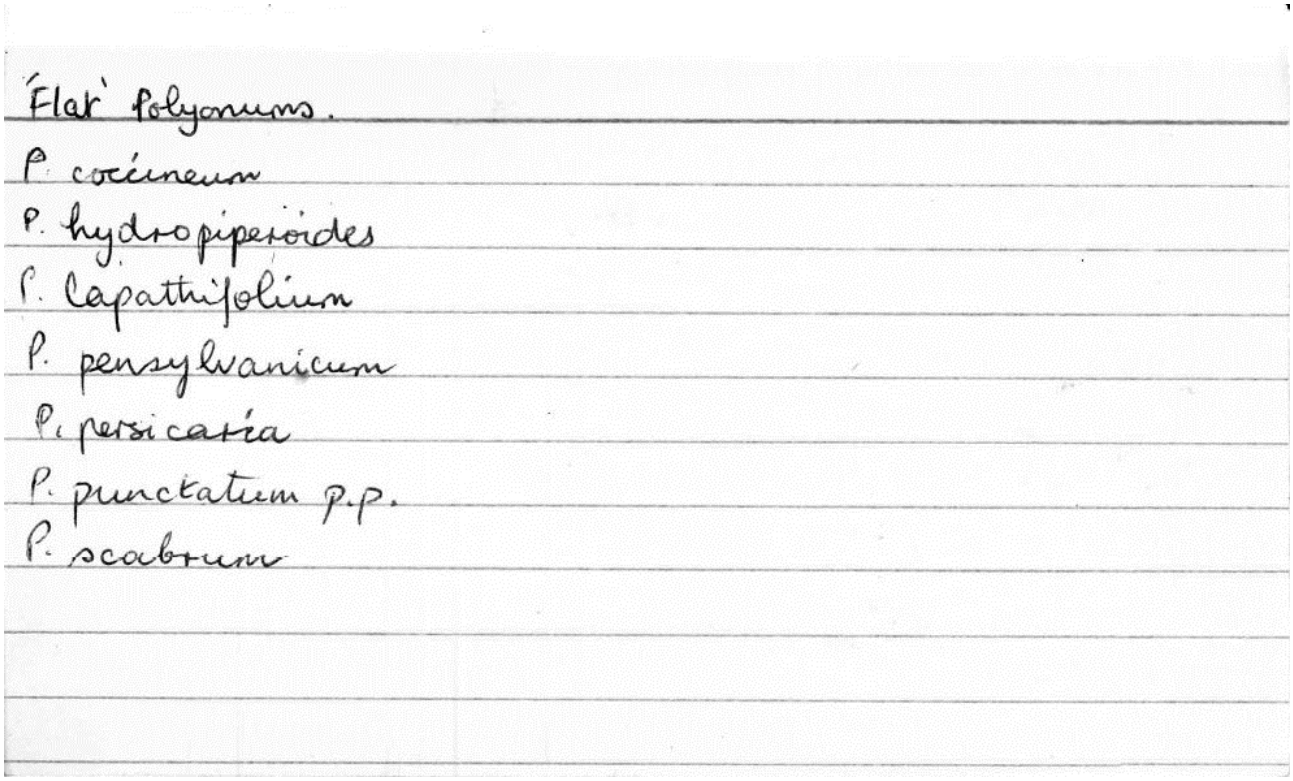
POACEAE

Molinia caerulea



POLYGONACEAE

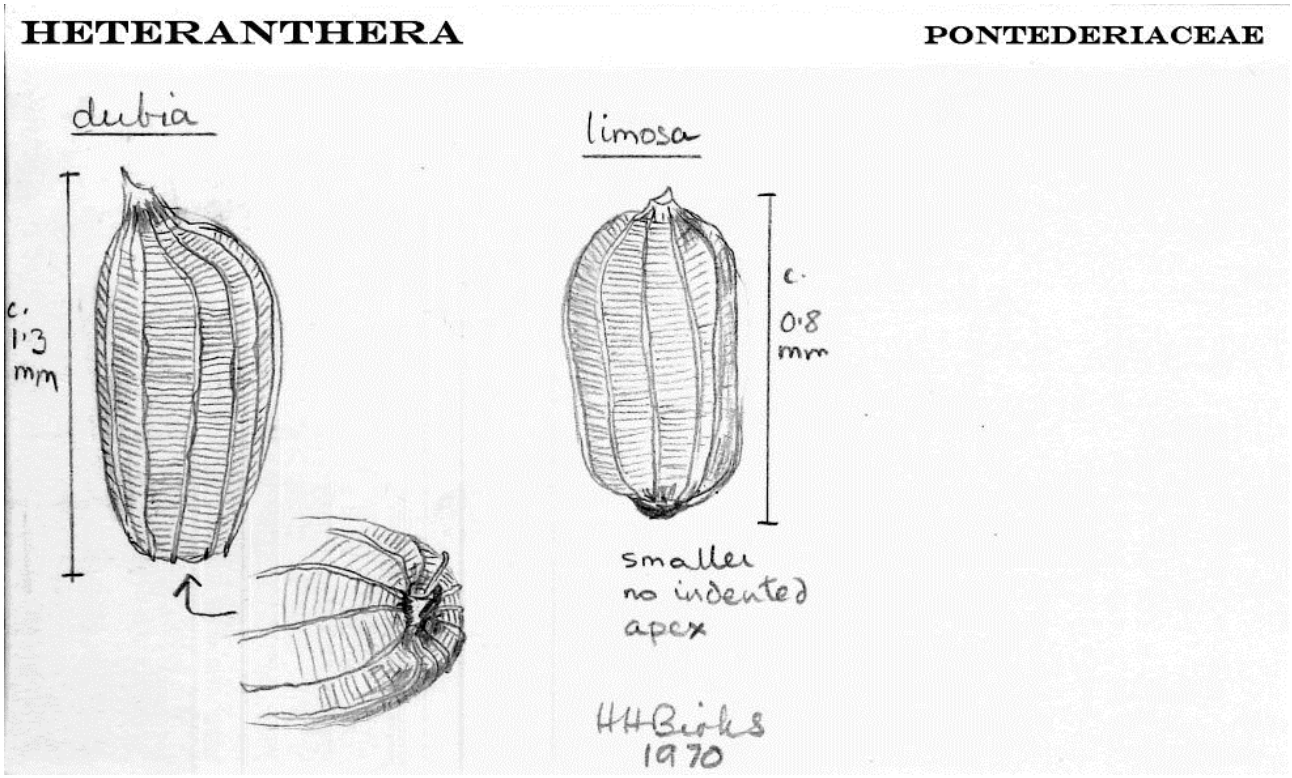
Polygonum



PONTEDERIACEAE

Heteranthera

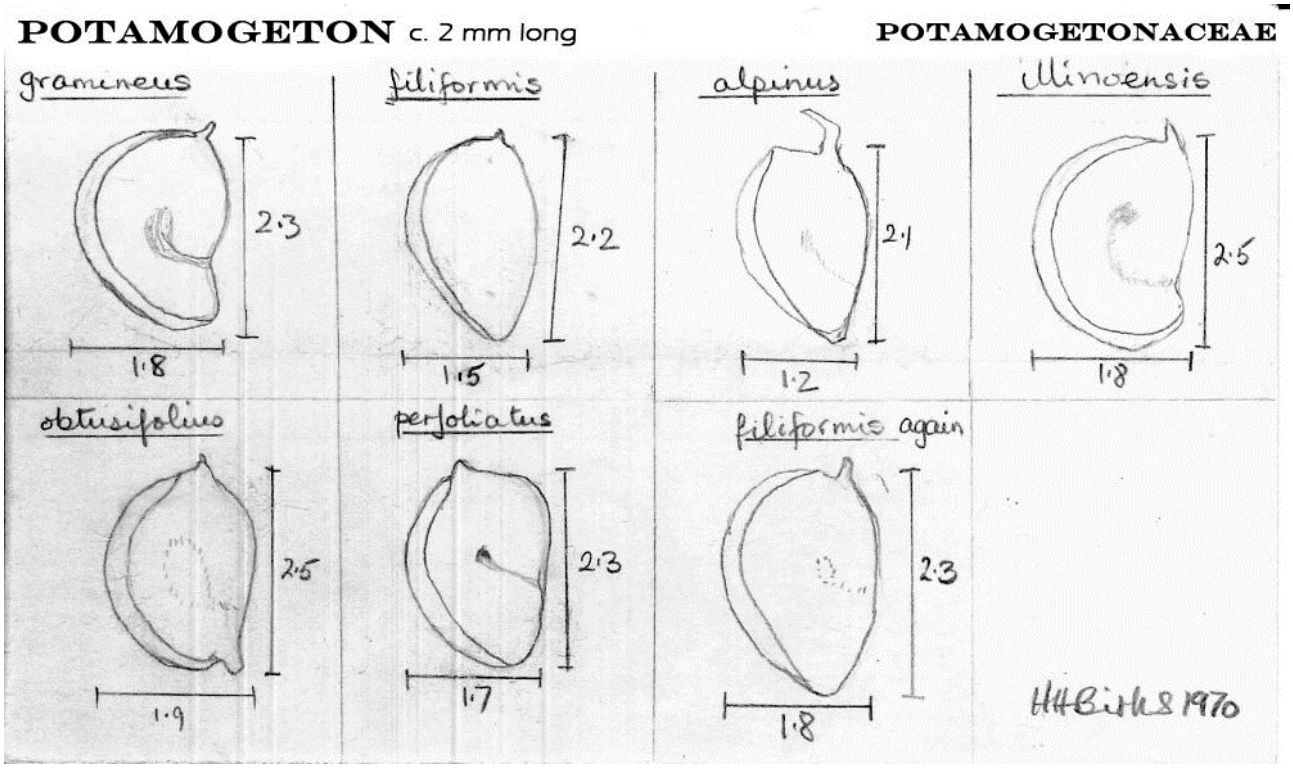
dubia, limosa



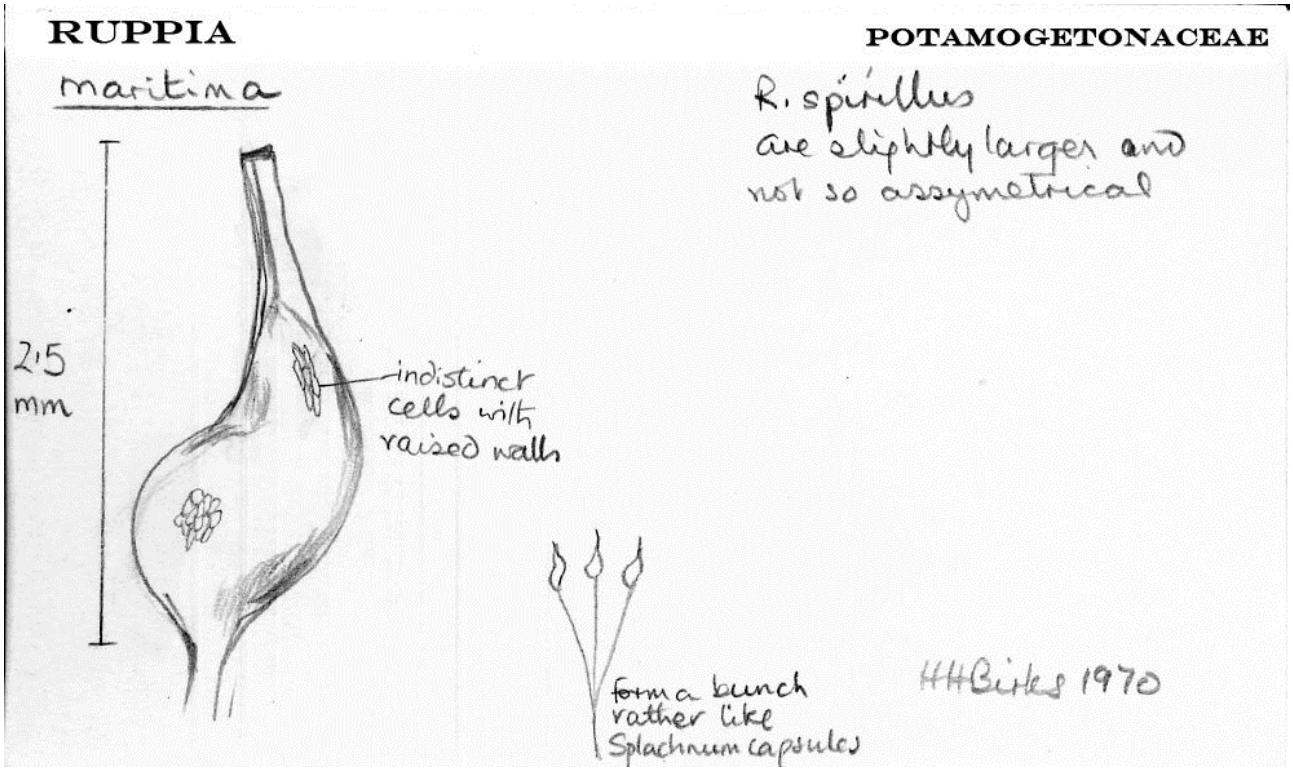
POTAMOGETONACEAE

Potamogeton

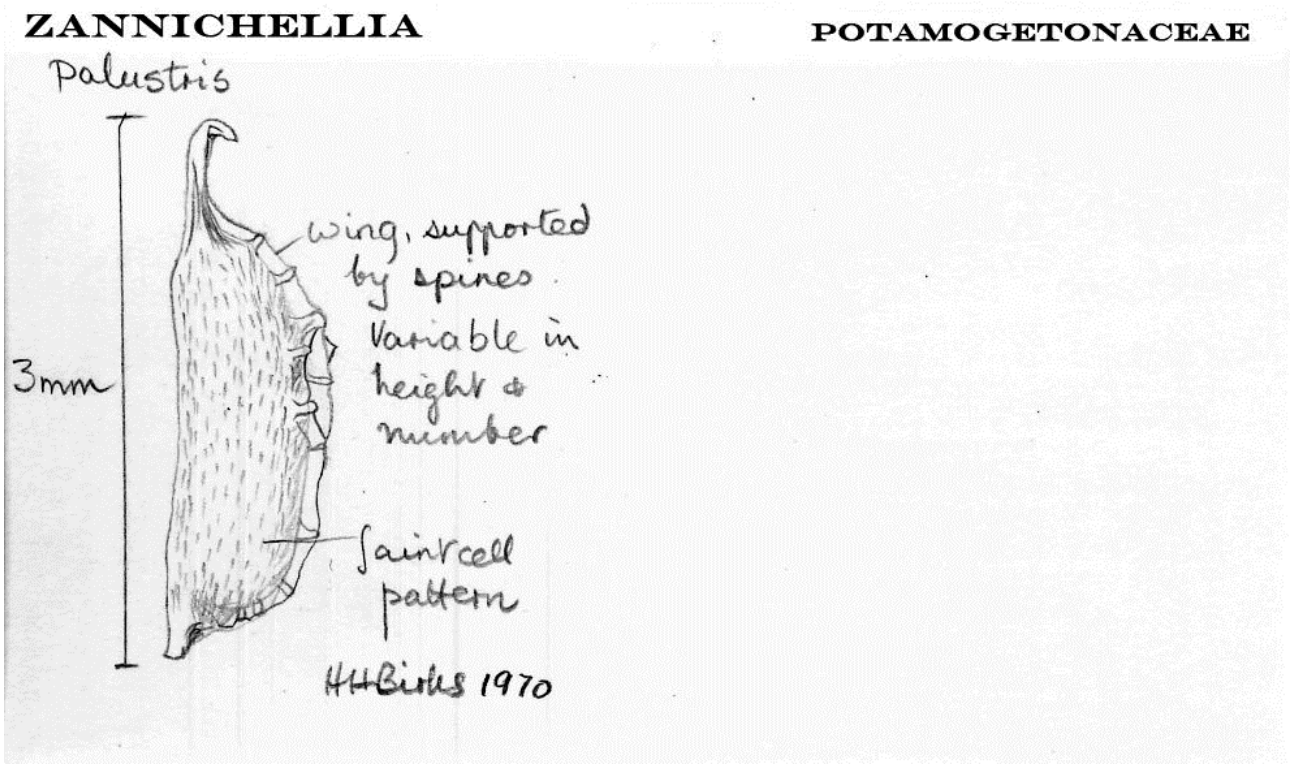
gramineus, filiformis, alpinus, illinoiensis, obtusifolius, perfoliatus



Ruppia maritima

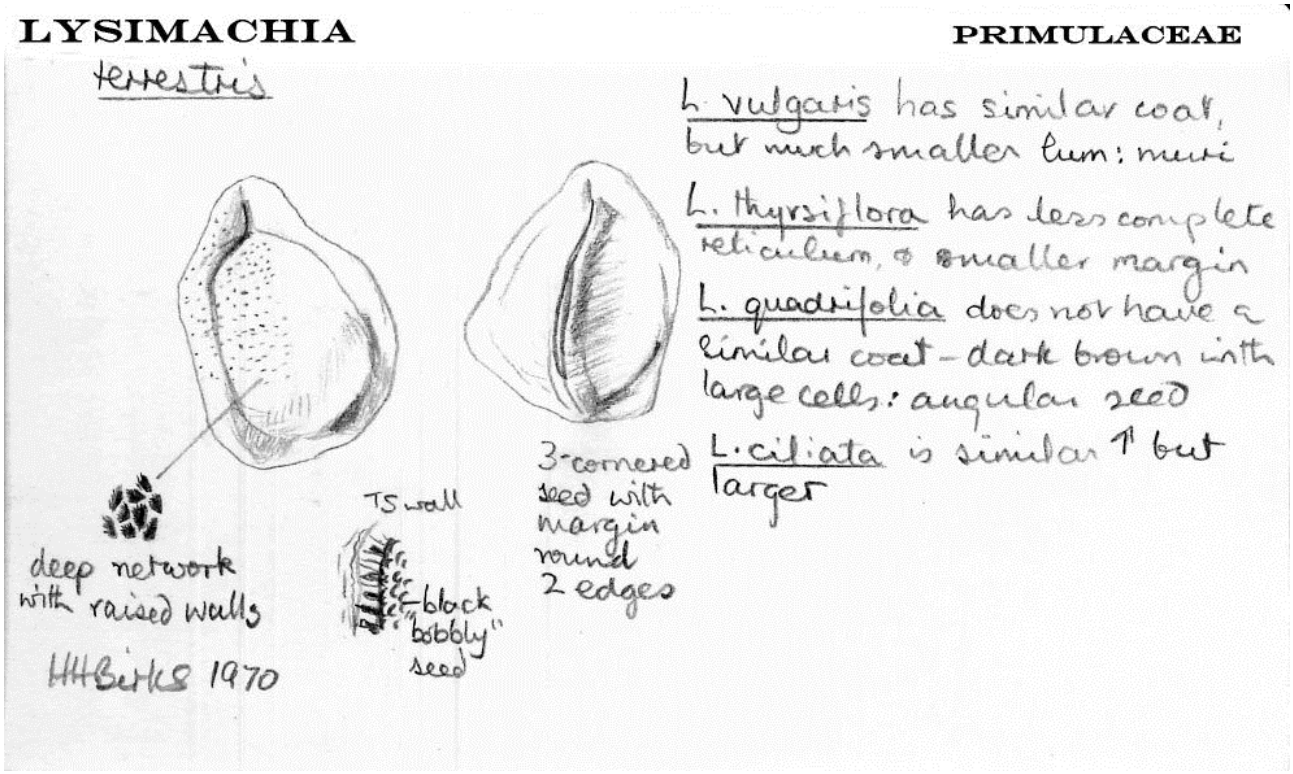


Zannichellia palustris



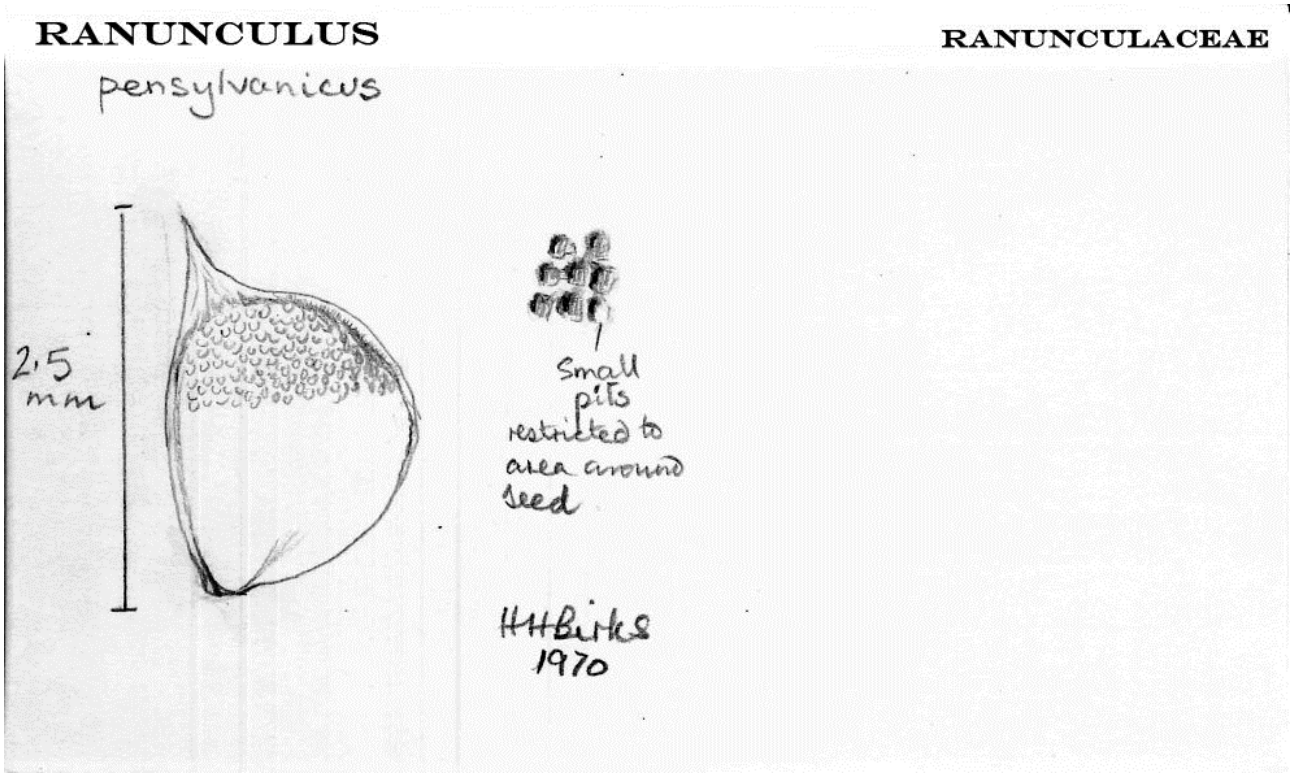
PRIMULACEAE

Lysimachia terrestris

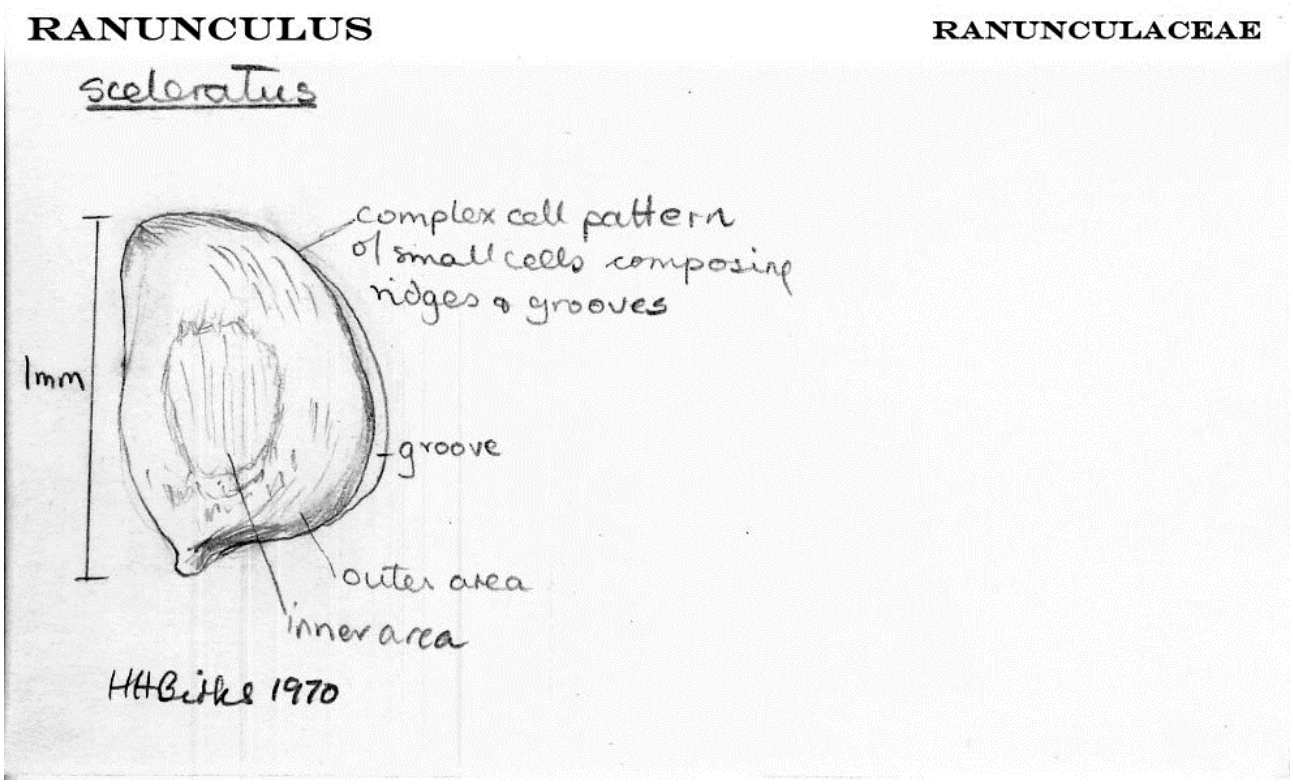


RANUNCULACEAE

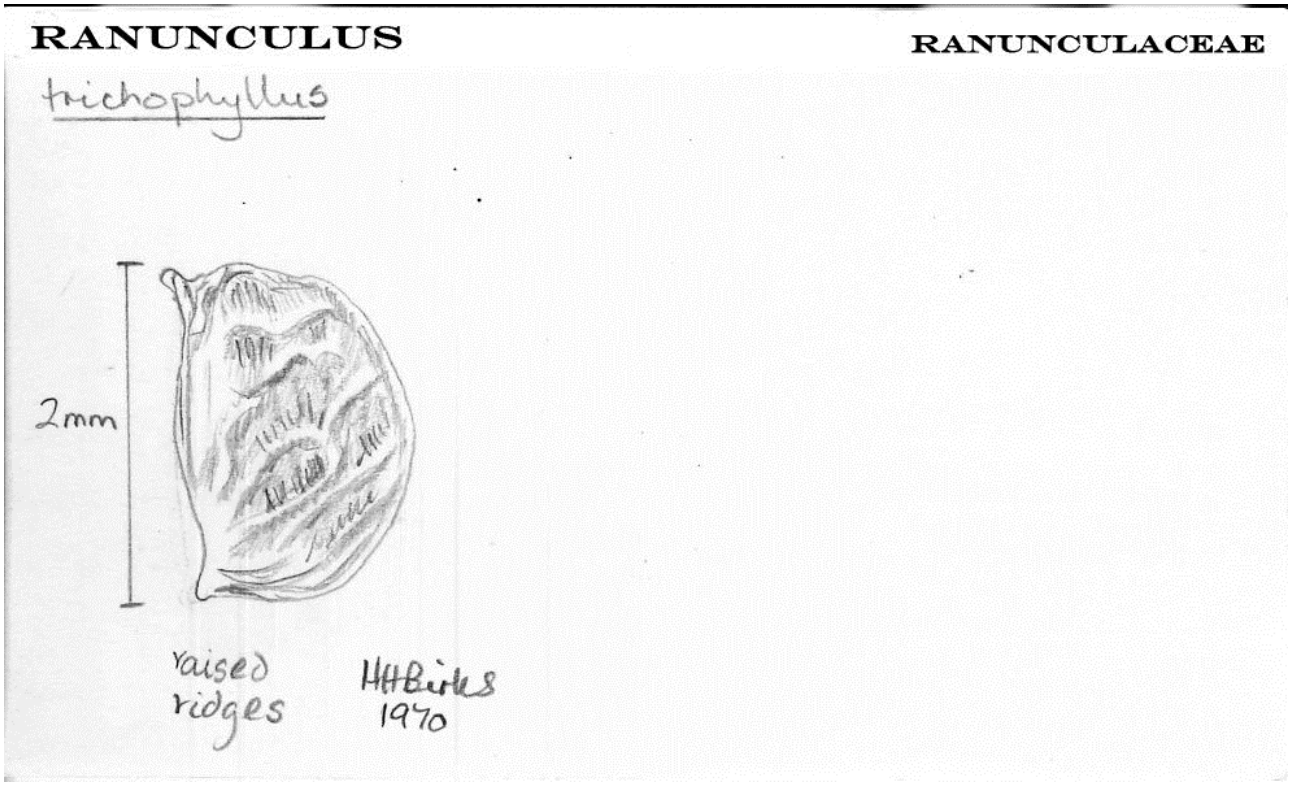
Ranuclus pensylvanicus



Ranunculus sceleratus

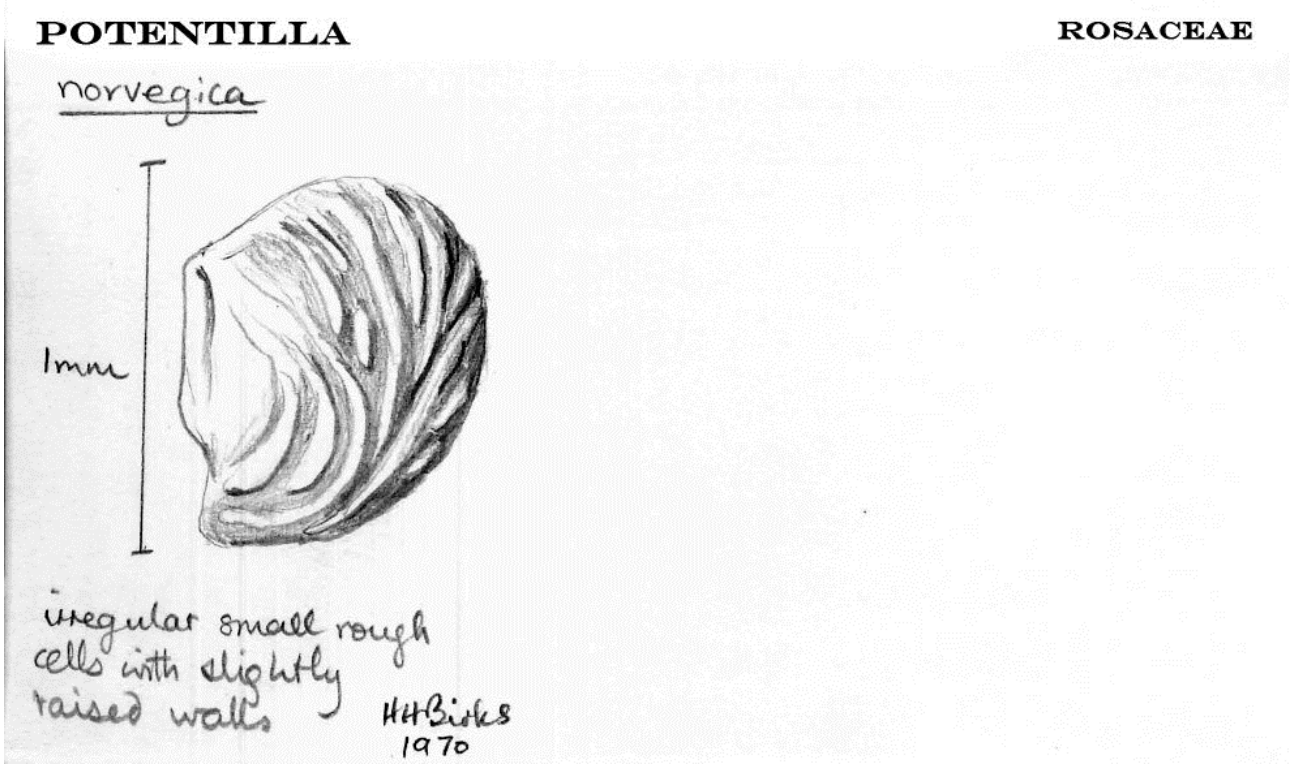


Ranunculus trichophyllus

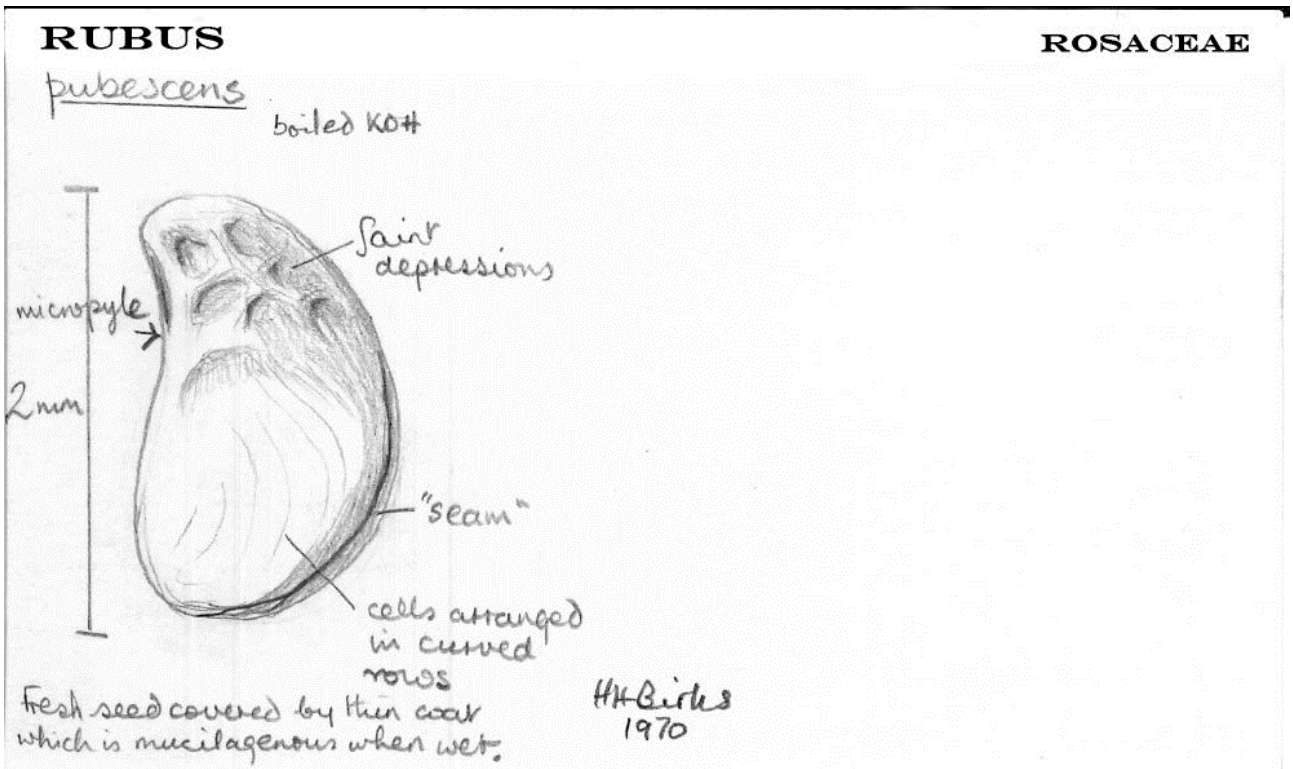


ROSACEAE

Potentilla norvegica

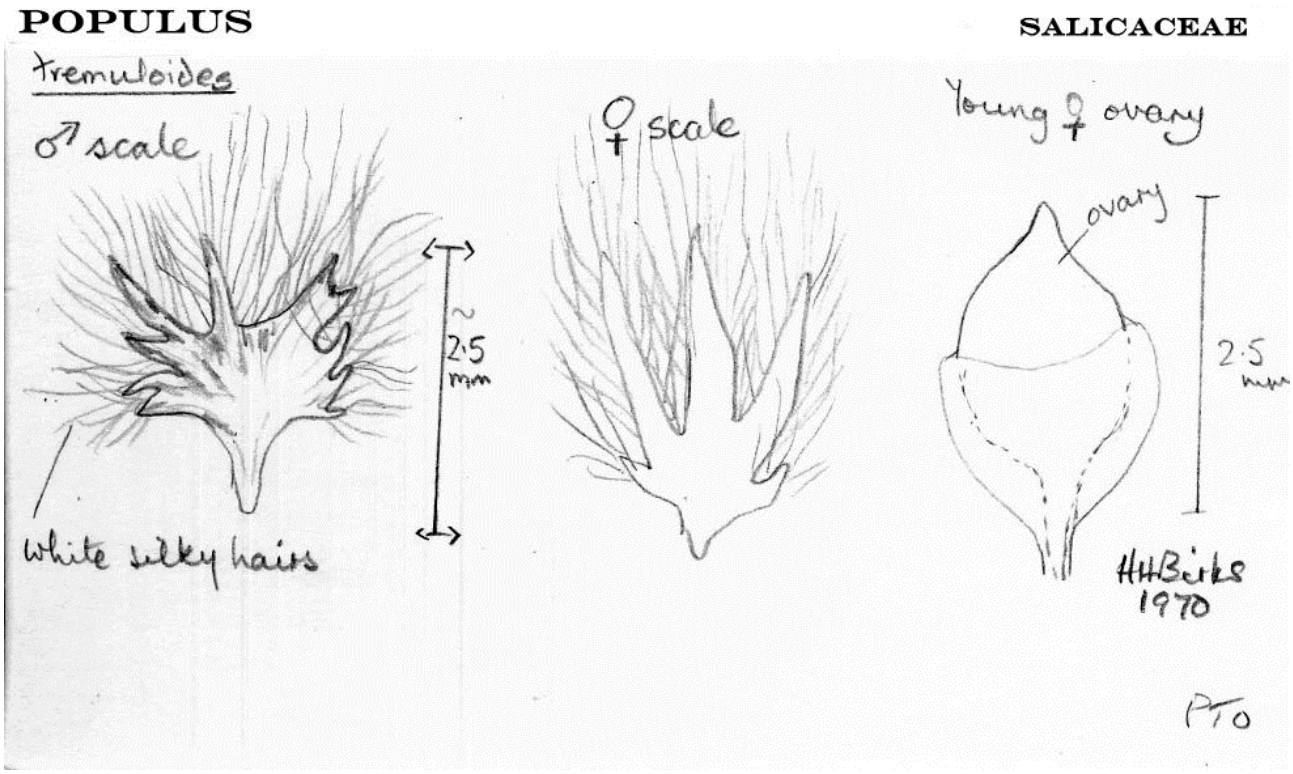


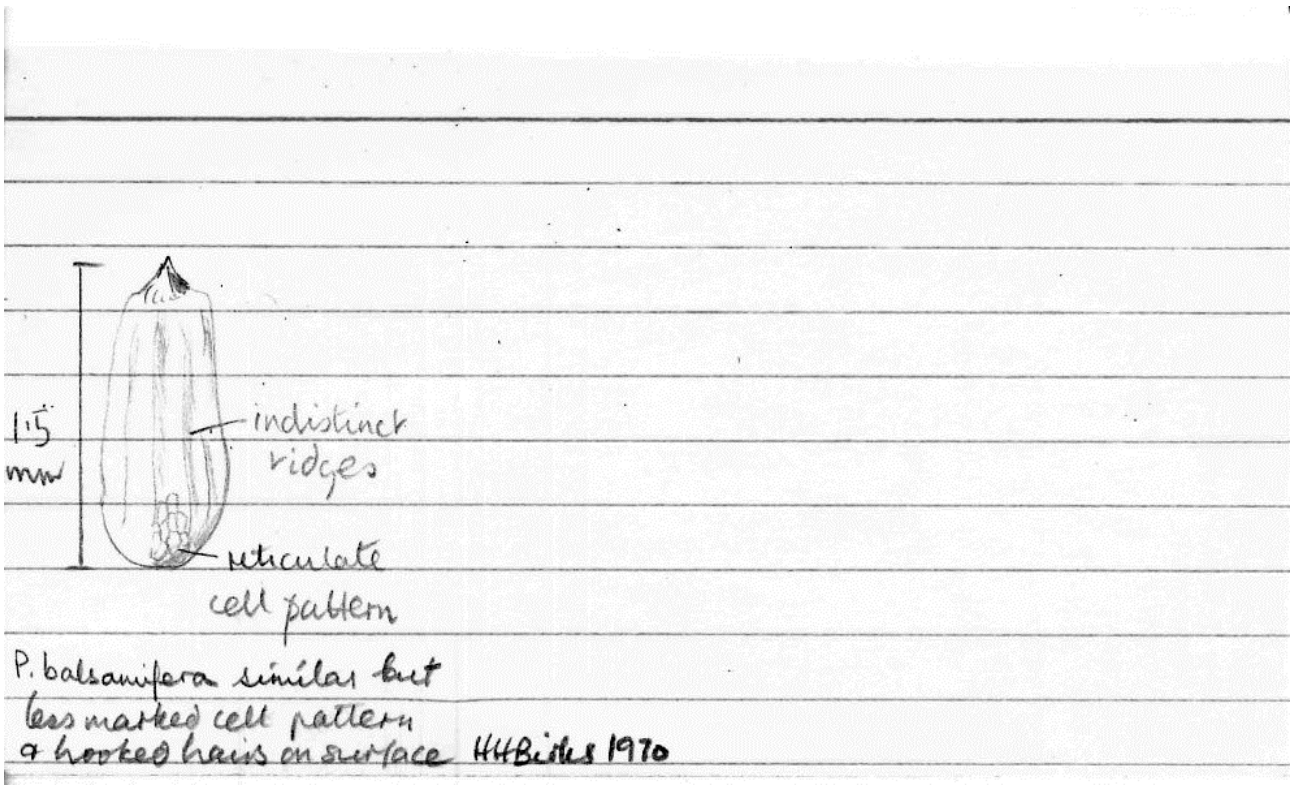
Rubus pubescens



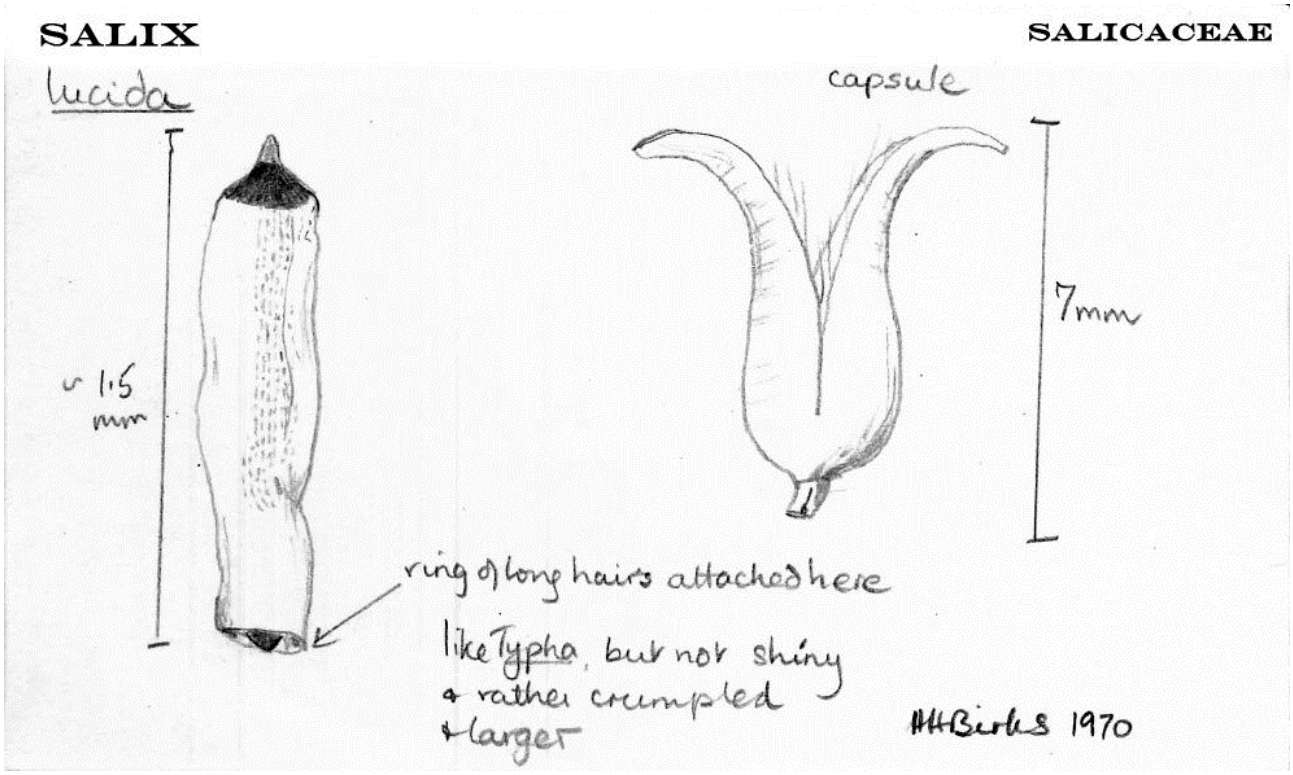
SALICACEAE

Populus tremuloides



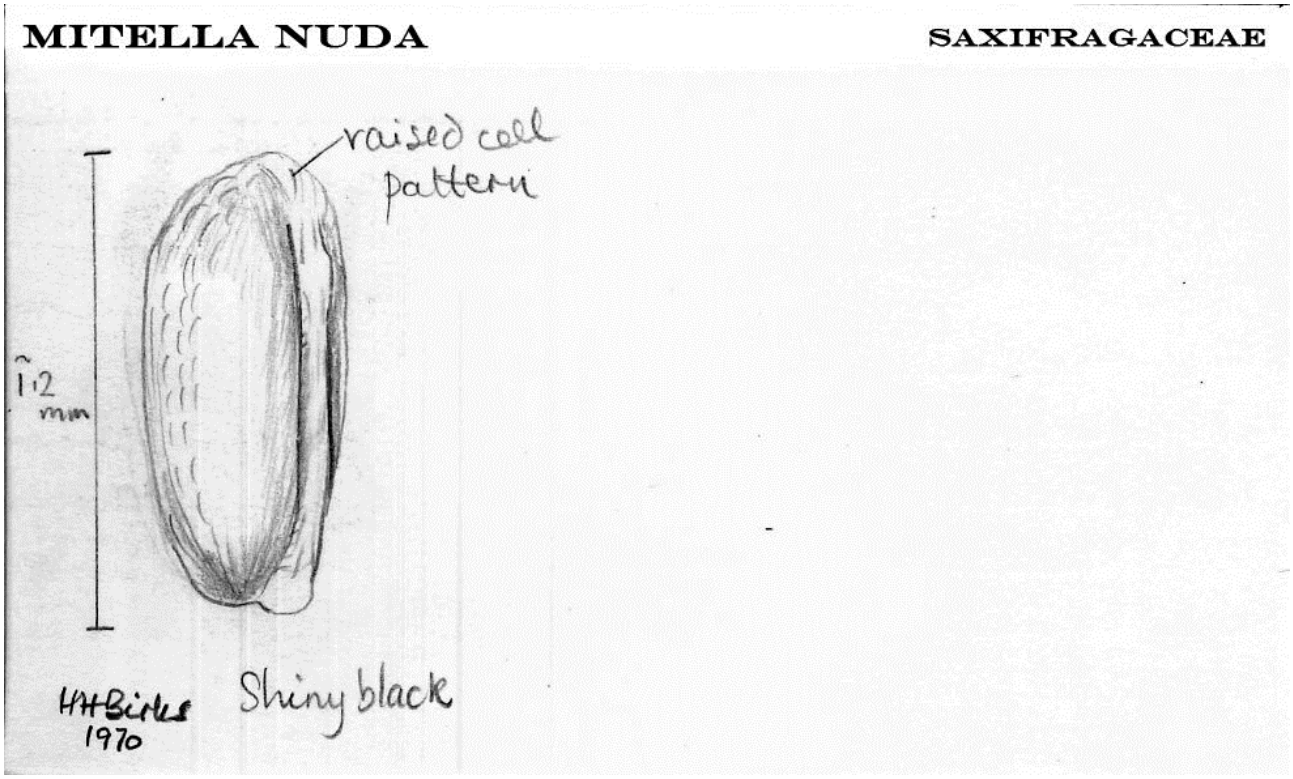


Salix lucida

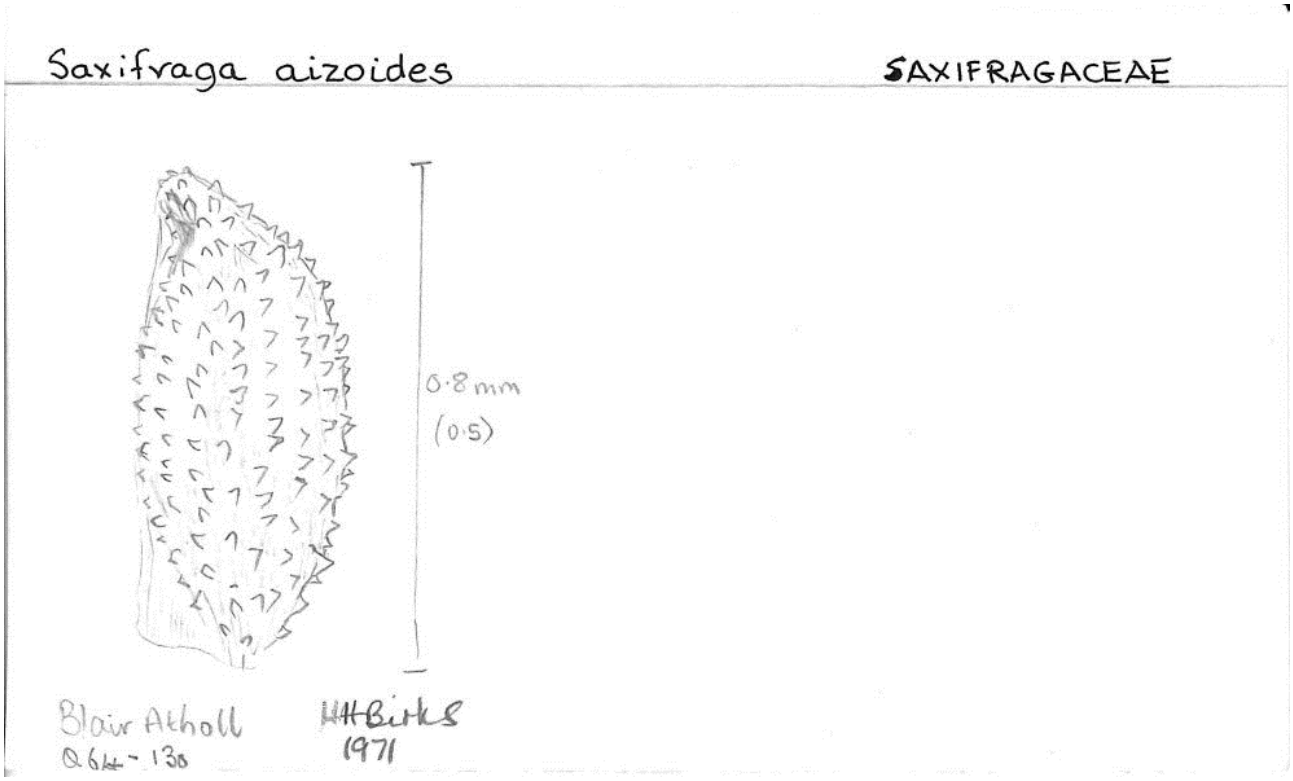


SAXIFRAGACEAE

Mitella nuda



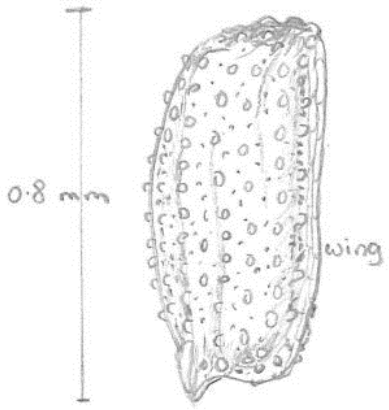
Saxifraga aizoides



Saxifraga hypnoides

Saxifraga hypnoides — SAXIFRAGACEAE

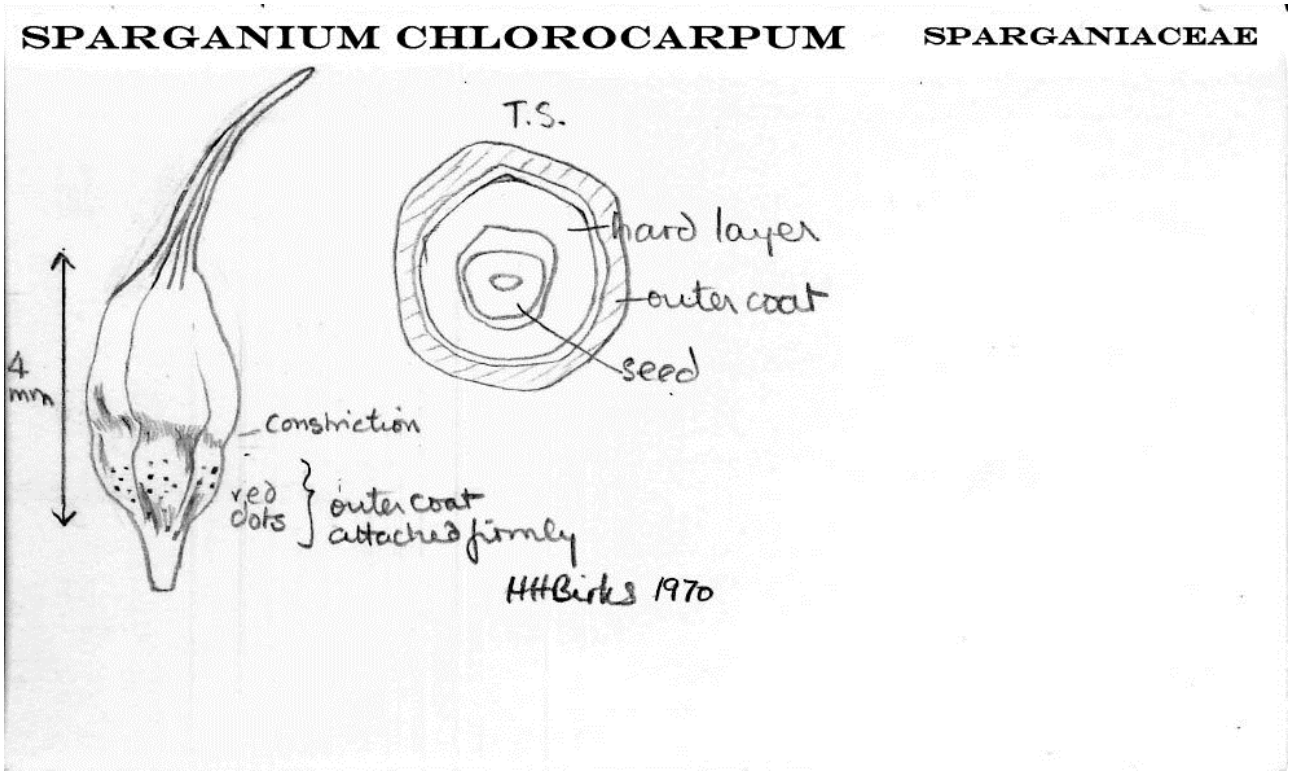
large papillae in ± longitudinal rows
very small papillae in between



HHBirks 1971

SPARGANIACEAE

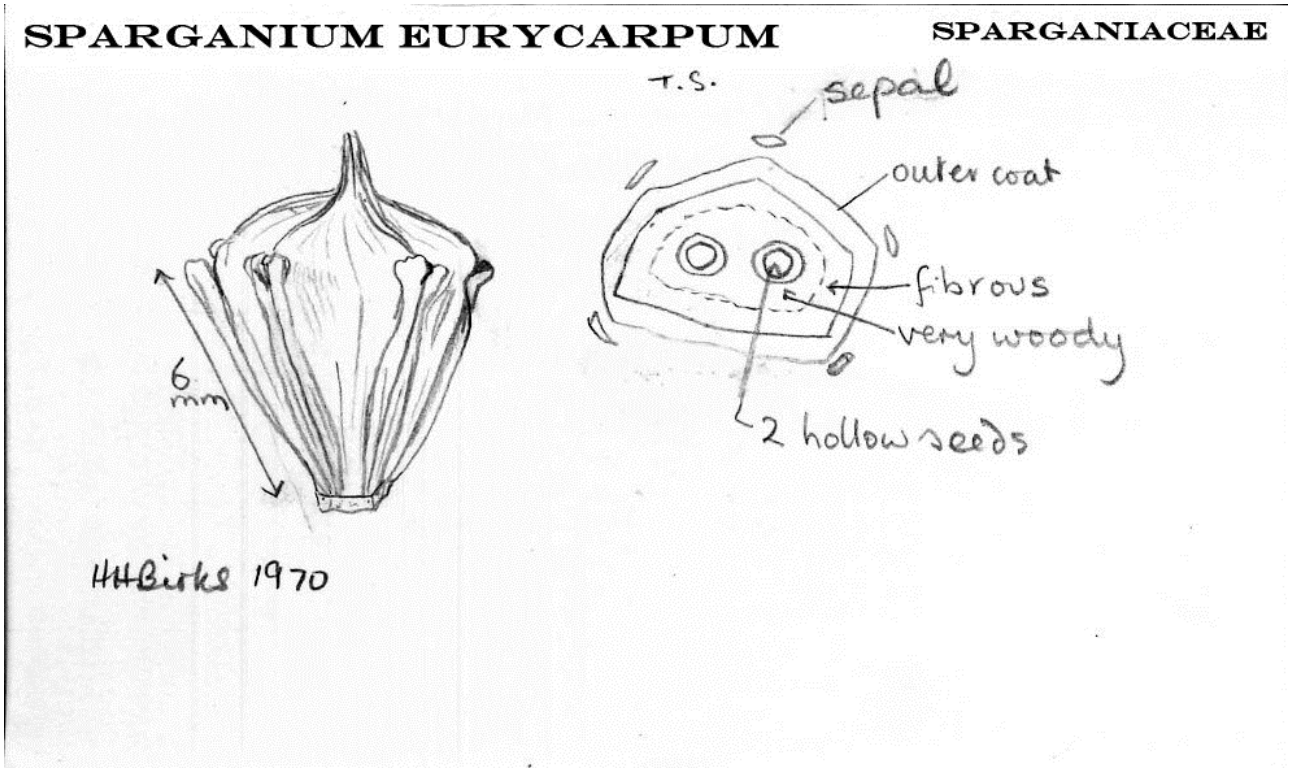
Sparganium chlorocarpum



Similar fruits occur in S. americanum
S. androcladum
S. angustifolium
S. fluctuans
S. glomeratum
S. minimum

May be separable on size, and ribbing of inner hard layer

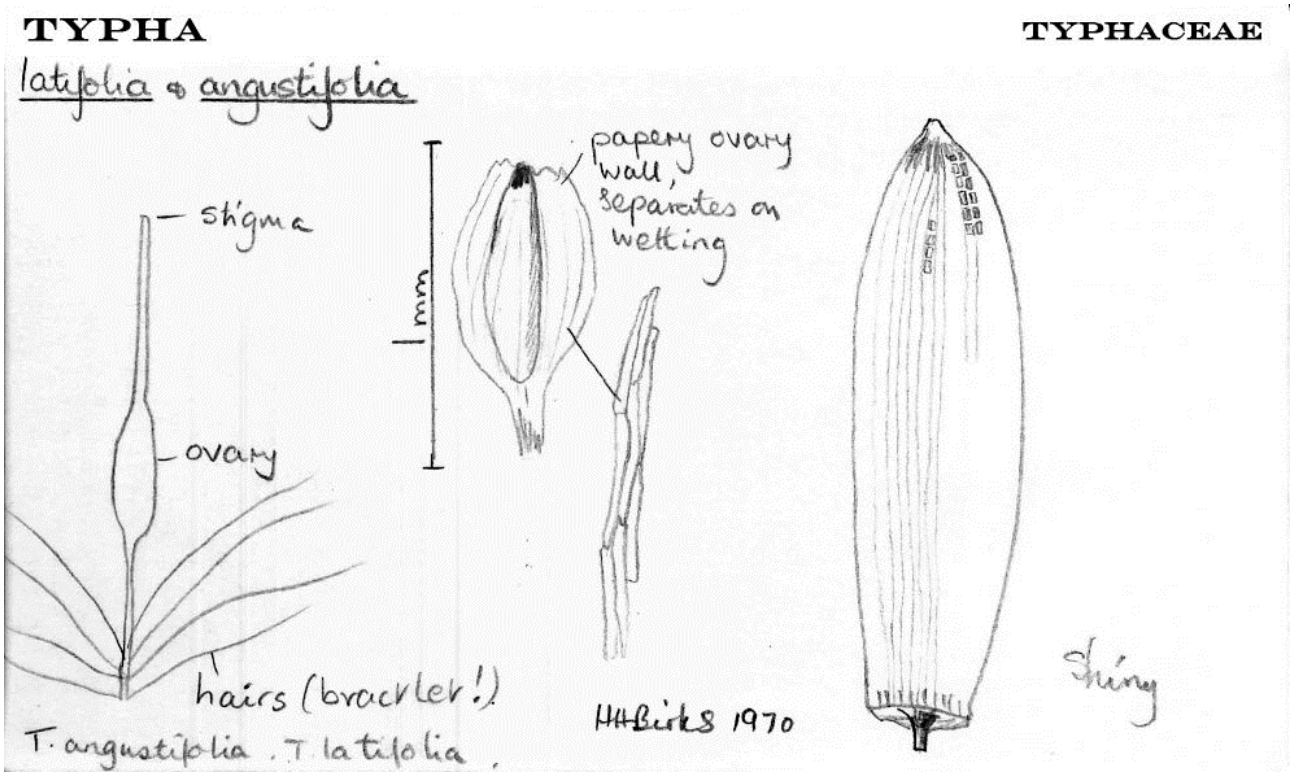
Sparganium eurycarpum



TYPHACEAE

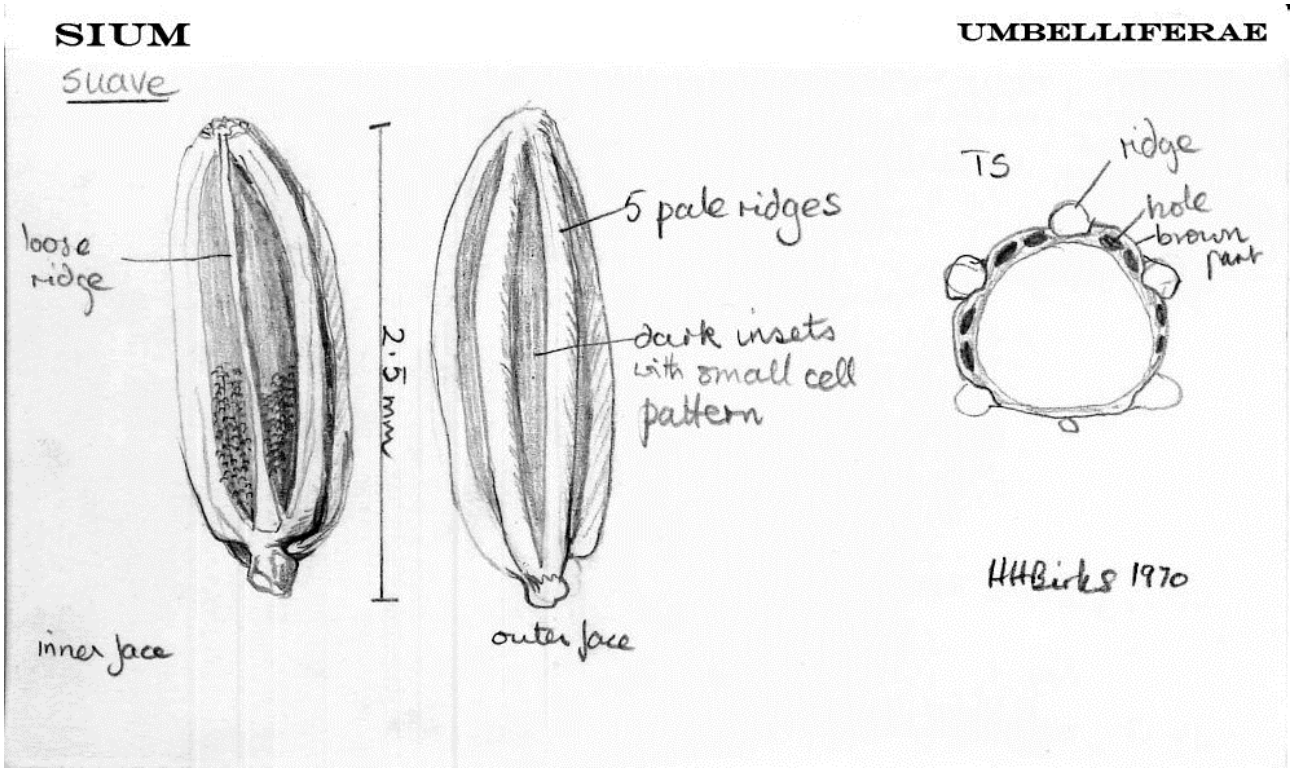
Typha

latifolia* & *angustifolia



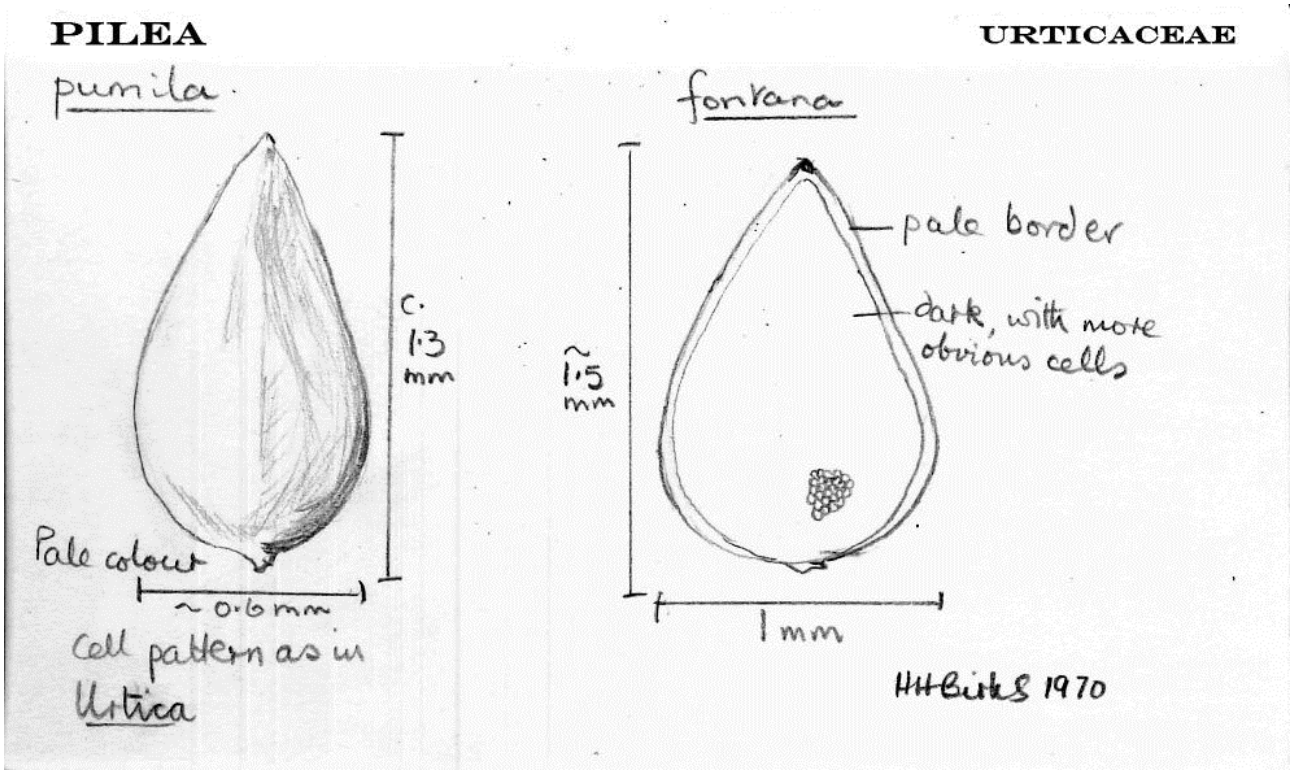
UMBELLIFERAE

Sium suave

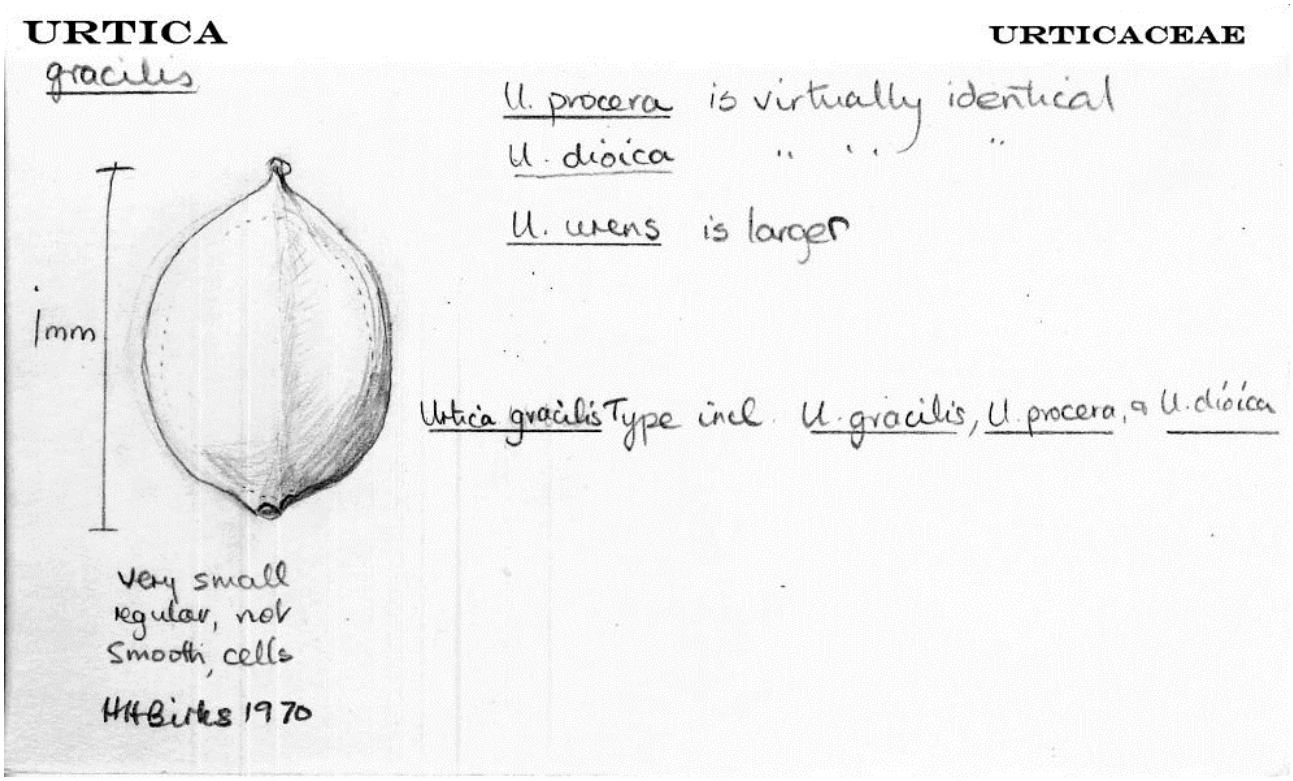


URTICACEAE

Pilea pumila

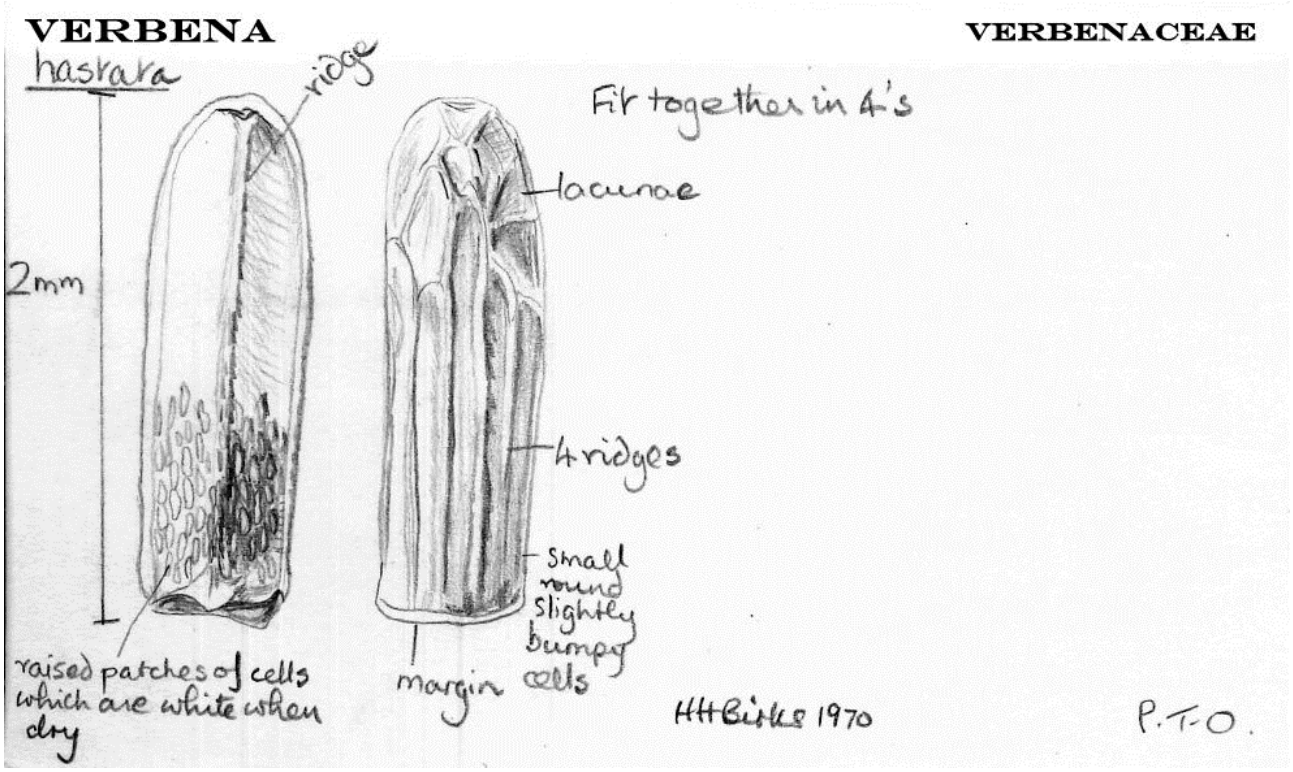


Urtica gracilis



VERBENACEAE

Verbena hastata



V. bracteata 2mm. better marked ridges + lacunae, white patches on proximal side smaller + more 'spiky'. No central ridge

V. officinalis. Similar. very hooded apex

V. simplex. Rather smooth, small patches of white cells. Lacunae well marked, starting ½ way down

V. urticifolia Fewer small white areas. Back ridges + lacunae not well marked.

VIOLACEAE

Viola pallens