

# CATEGORY 22

## Epidermal Non-Quadrilateral Seed or Fruit Epidermis

- 22I. Irregularly shaped (bumpy, anticlinal, and angular types)
  - 22IA. Large, smooth projections (bumps)
    - c. irregularly angled projections not distinct, stalk angular if present
  - 22IB. small projections on surface, shape very irregular
    - a. many long, thin projections
    - b. variable projections
    - c. rounded projections (seen in *Thalia geniculata*, Marantaceae; diagnostic level not determined)
    - d. rugulose surface (seen in *Bixa orellana*, diagnostic level not determined)
  - 22IC. anticlinal cells with small projections on one plane; central projection (Burseraceae, *Trattinnickia glaziovii*, family level diagnostic)
  - 22ID. anticlinal cells with projections on both sides, large rounded projection on one side (Burseraceae, *Protium fimbriatum*, family level diagnostic)
  - 22IE. small anticlinal cells with fine projections (Ulmaceae, *Celtis schippii*, species level diagnostic)
  - 22IF. angled to irregularly quadrilateral; surface grainy; small;
    - a. projections on edges (Lauraceae, *Chlorocardium venenosum*, family level diagnostic)
    - b. no projections, flat to undulating grainy surface, in *Cyperus* (diagnostic level not determined)
- 22II. polyhedral epidermal cells (in top view) with conical projections (Cyperaceae, family level diagnostic)
  - 22IIA. decorated
    - a. entire upper surface decorated (Cyperaceae, *Cyperus*, genus level diagnostic)
    - b. edges of upper surface decorated (Cyperaceae, *Carex*, genus level diagnostic)
  - 22IIB. smooth; projection tall, edges recurved or decorated (Cyperaceae, *Scirpus*, genus level diagnostic)
  - 22IIC. undecorated; projection short, surface curved or undulating, in *Cyperus*, polyhedral to quadrilateral (diagnostic level not determined)
- 22III. conical projections; not polyhedral in top view
  - 22IIIA. glume cells with large projections arising from deeply serrated cells (Poaceae, *Oryza sativa*, genus level diagnostic)
  - 22IIIB. glume cells with small projections
- 22IV. elongate; very deeply serrated
  - 22IVA. serrations with straight edges
  - 22IVB. serrations with sinuous edges
  - 22IVC. serrations very irregular\*
- 22V. bottle shape
  - 22VA. narrow (Poaceae, *Oryza sativa*)
  - 22VB. wide, flaring (Poaceae, *Oryza* sp.)
- 22VI. seed epidermis, cells irregularly thick (“puffed”), entire surface with beadlike projections; radial appendages (Chloranthaceae, *Hedyosum guaduatyatum*, family level diagnostic)
- 22VII. Cylindrical seed bodies (Marantaceae)
  - 22VIIA. smooth/solid cylinder shaft (*Maranta* ssp., genus level diagnostic)
    - a. long cylinder, smooth surface (*Maranta* ssp., genus level diagnostic) (surface may have few to many large projections)
    - b. shortened cylinder, grainy surface (*Maranta arundinacea*, species level diagnostic)
    - c. shortened cylinder, smooth surface; robust single and bifurcated angular projections; tip smooth (*Stromanthe*, genus level diagnostic)

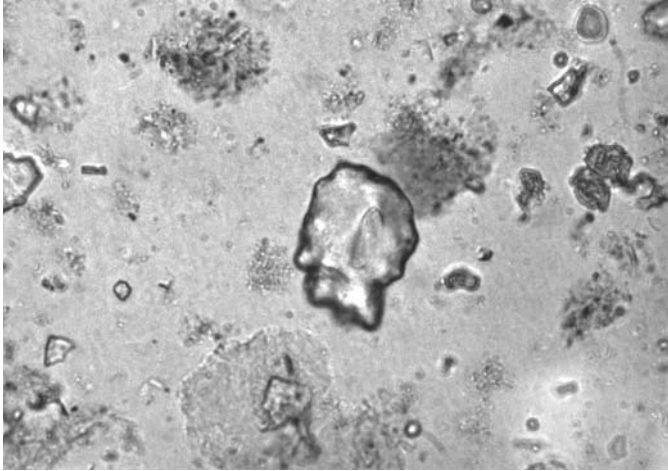
- 22VIIB. porous to densely ciliate cylinder shaft, abundant three dimensional spots and bumps
- a. shaft with corkscrew twist along axis (wild Marantaceae, *Ischnosiphon*, family level (wild) diagnostic)
  - b. shaft straight along axis (wild Marantaceae, *Calathea*, *Thalia*, family level (wild) diagnostic)
  - c. shaft twisted/broken irregularly; may be very shortened
    1. acuminate or acute tip/stalk (*Calathea* spp., genus level diagnostic)
    2. broad, blunt tip, granular surface (*Calathea allouia*, species level diagnostic)
    3. flattened, grainy “tip” with thin spines around edge of disk (*Calathea allouia* species level diagnostic)
  - d. broken cylinder pieces (diagnostic level: Marantaceae NOT *Maranta* spp.)
  - e. shaft short (about as long as wide, or shorter) or elongated, tip a sphere enclosed in top of shaft (*Donax*, *Thalia*)
- 22VIIC. Broken “tips” (Use traits of shaft/tip of seed body to classify: underside shows remains of cylinder texture)
- a. *Maranta* spp. tip
  - b. *Maranta arundinacea* tip
  - c. *Calathea* spp. Tip
- 22VIID. Cylinder shaft has porous appearance, covered with long cilia
- a. cylinder long un-segmented, head is short, smooth to bumpy, extends down side of cylinder. (*Donax*)
  - b. like above, but cylinder broken off very short (*Donax*)
  - c. Cylinder fragment, as above
- 22VIIE. Irregular shaped with smooth, complex, robust projections. Robust tip that is a continuation of the cylinder. (*Stromanthe*)
- 22VIII. Fruitcase and glume bodies (Poaceae) with speculate projections (distinct stalk with rounded or bead-like head)
- 22VIII A. roughly rectangular in outline, thickness variable; projections on all surfaces (not just marginal); projections sparse or plentiful
- a. wide, >7.5 microns (Diagnostic level: *Zea* spp. and some wild panicoid grasses)
  - b. narrow, <7.5 microns (diagnostic level: wild Poaceae)
- 22VIII B. irregular in outline; thickness variable; silicification variable; projections on all surfaces; may be sparse or plentiful (diagnostic level: *Zea* spp. and some wild panicoid grasses)
- 22VIII C. oblong, half-decorated; distinctly three-dimensional; upper part can be rounded or puffed and is decorated; base is smooth (diagnostic level: *Zea* spp.)
- 22VIII D. spherical bodies
- a. gracile sphere; lightly silicified; typically 10-15 microns, rarely larger than 20 microns; projections typically sparse (diagnostic level: *Zea mays*, domesticated)
  - b. robust globular body; heavily silicified (often appears purple); robust projections; most 20-50 microns (diagnostic level: *Zea* spp.)
- 22VIII E. tubular bodies with distinct rounded or pointed tips at each end (diagnostic level: wild Poaceae)
- 22IX. Spherical, burr-like, and elongate glume bodies with needle-like projections (diagnostic level: wild Poaceae, for example see *Digitaria* spp., *Arundinella hispida*)
- 22X. blocky, three-dimensional fruit case bodies
- 22XA. rectangular in outline with 1-3 semicircular cuts in the margin (diagnostic level: wild *Zea* spp., teosintes)
  - 22XB. Balsas teosinte type

\*NO card in MU card file

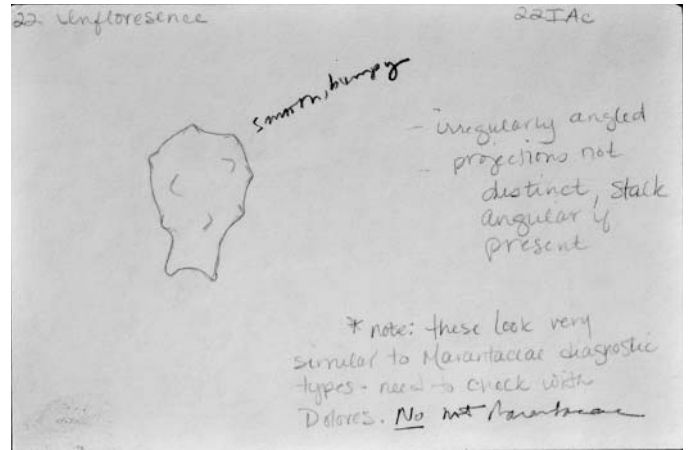
22

Epidermal non-quadrilateral: Seed Epidermis  
Fruit epidermis

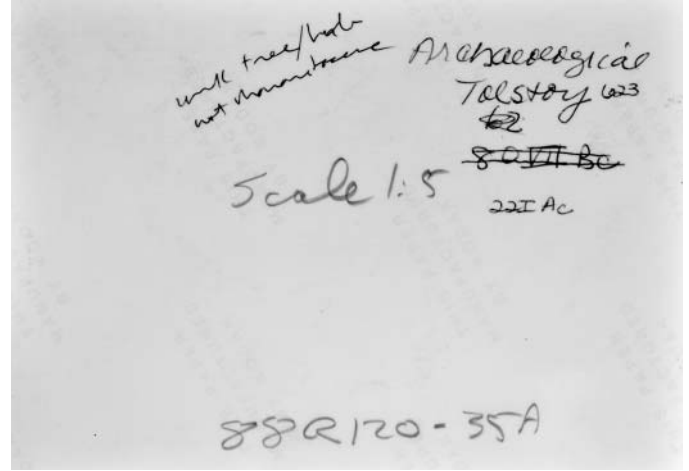
22 card1.jpg



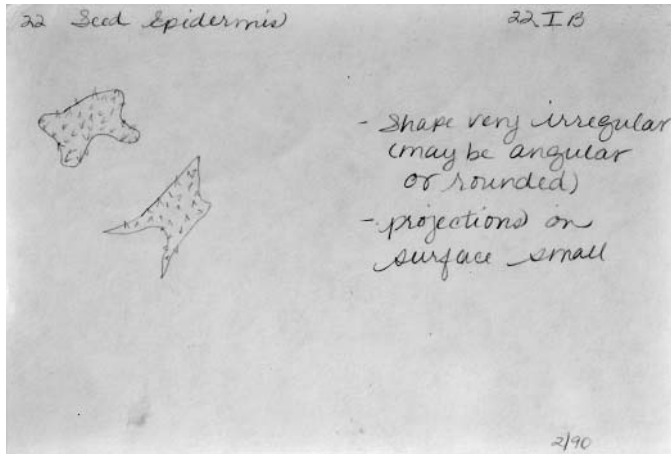
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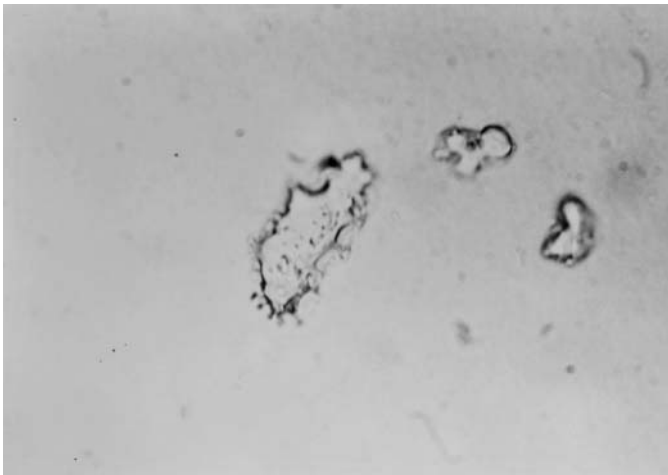
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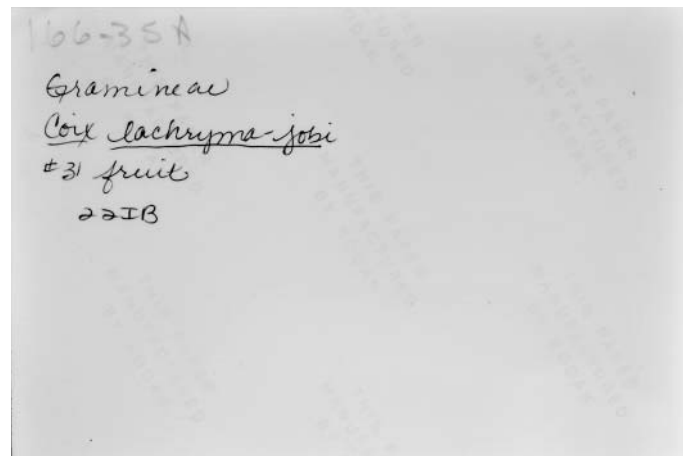
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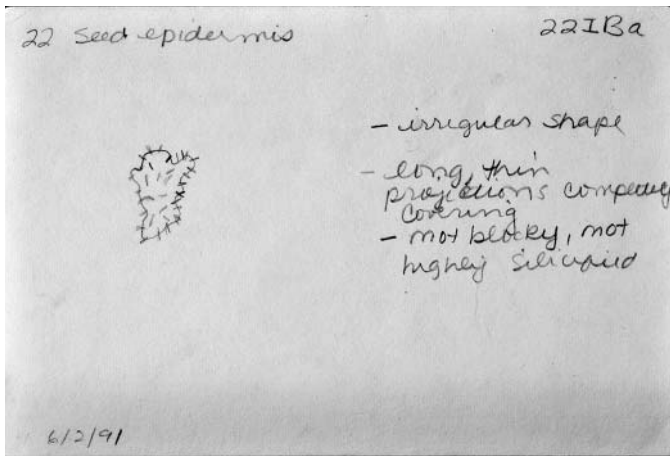
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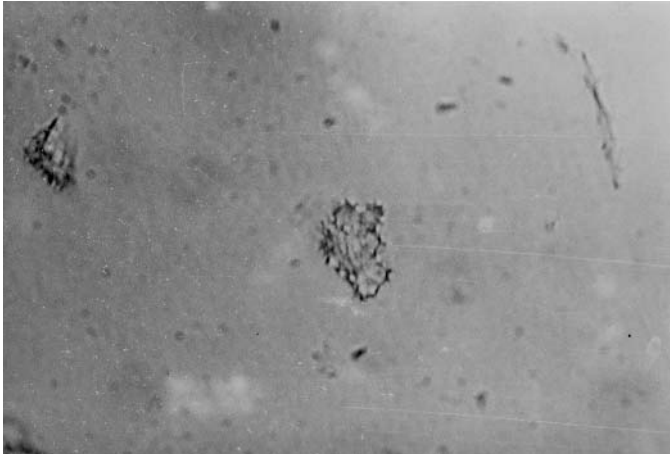
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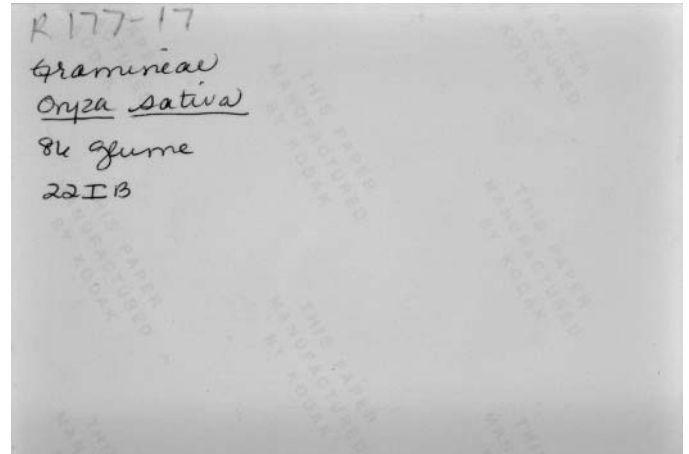
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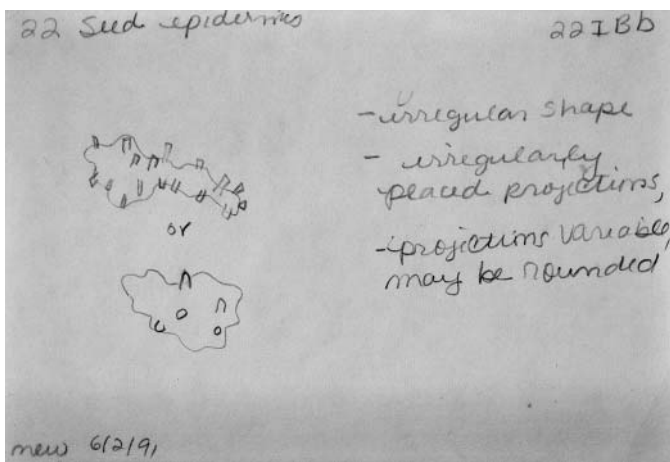
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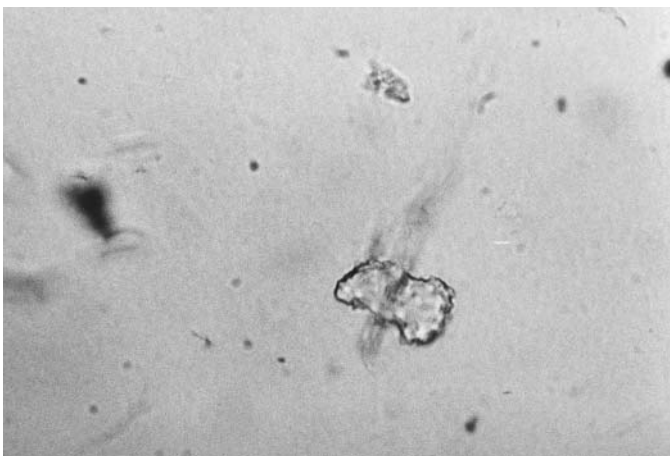
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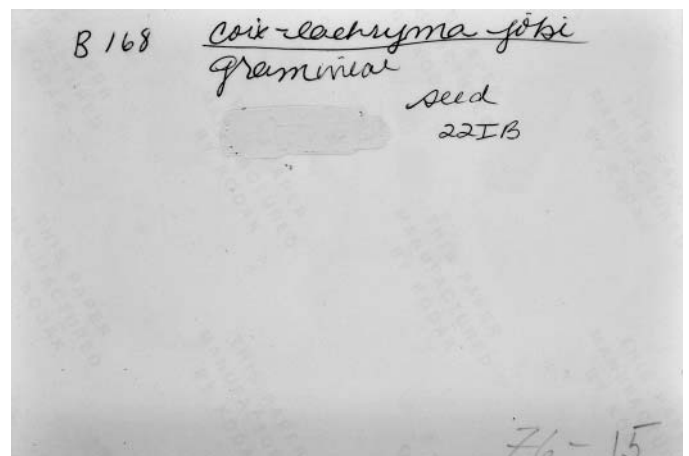
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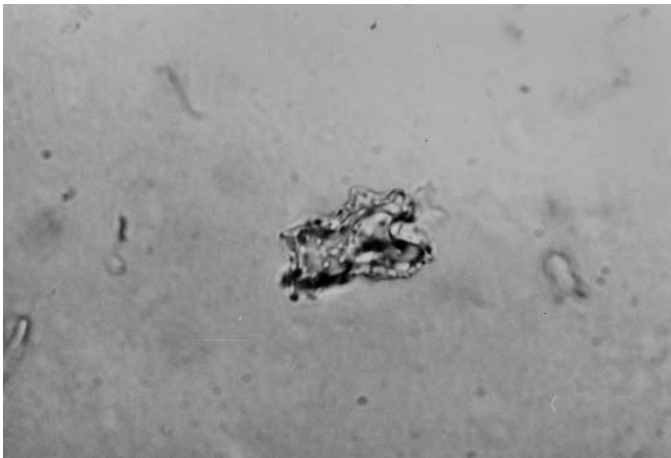
22IBb card1.jpg



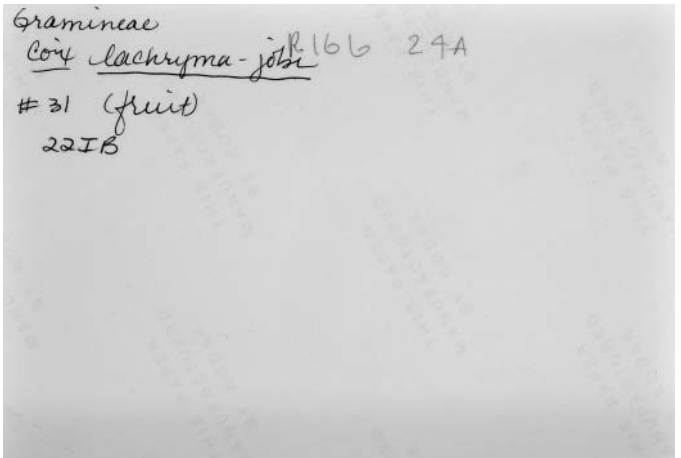
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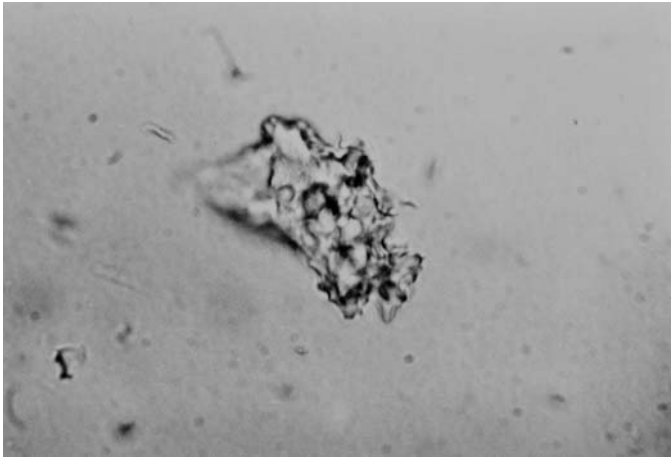
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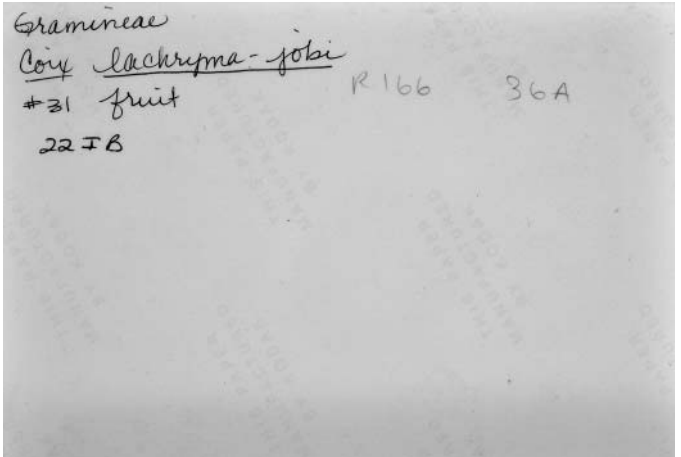
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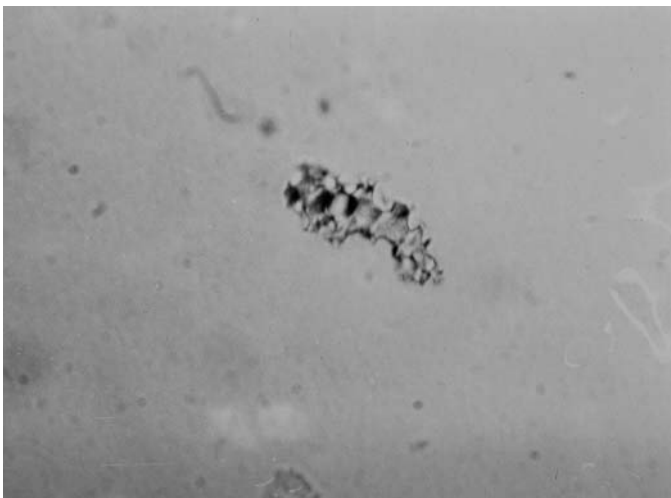
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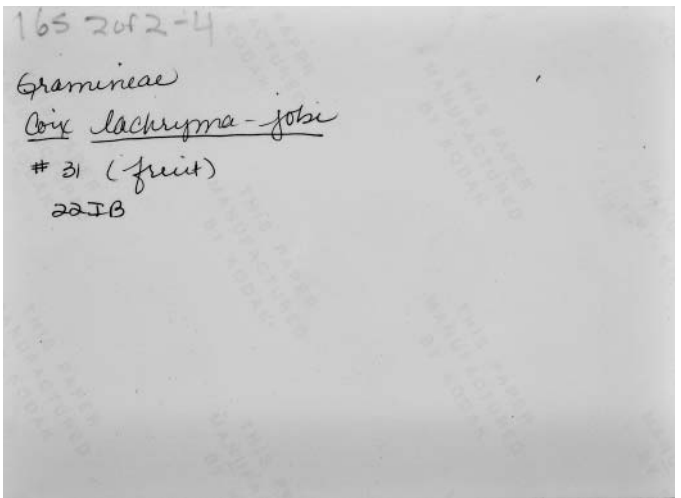
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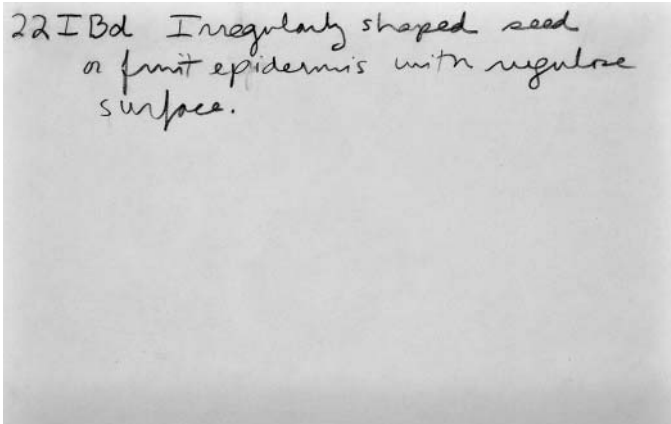
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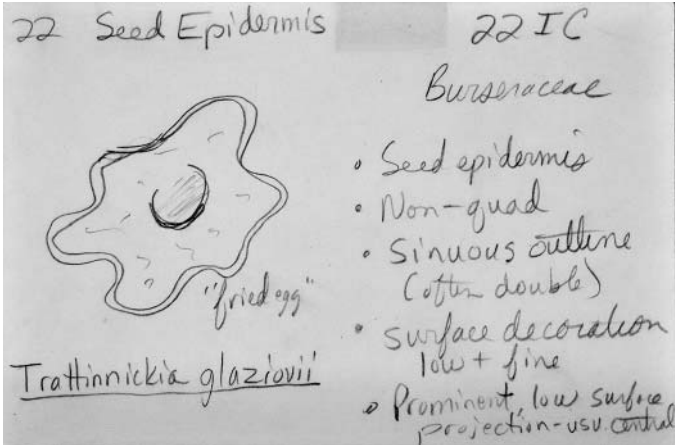
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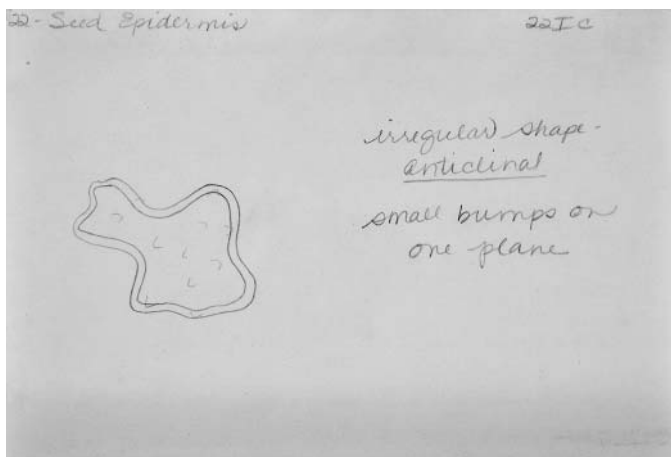
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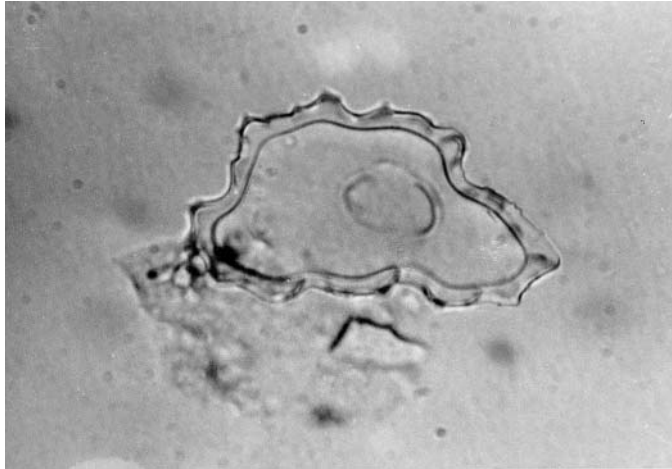
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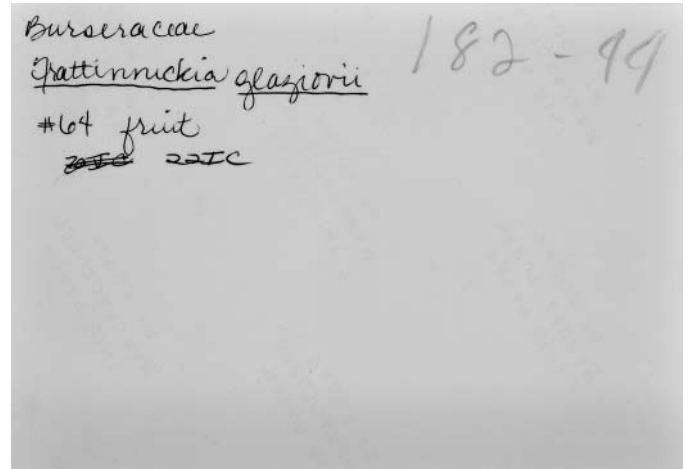
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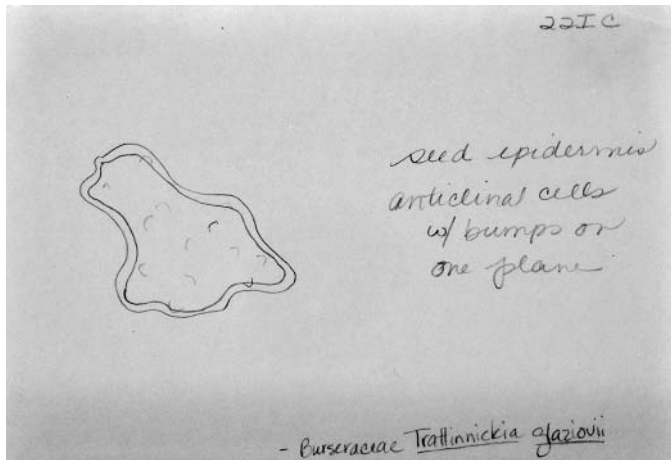
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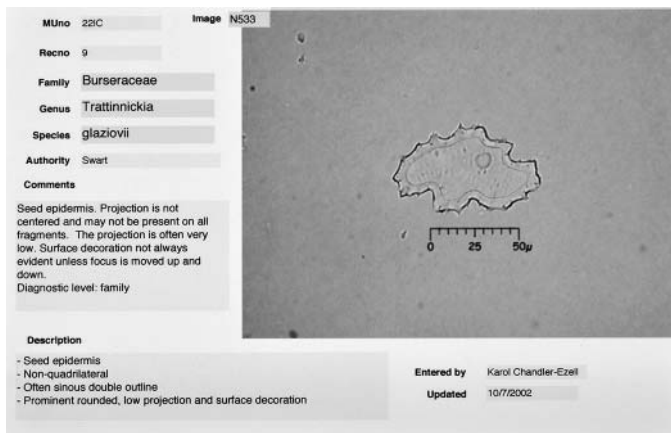
22IC photo1f.jpg



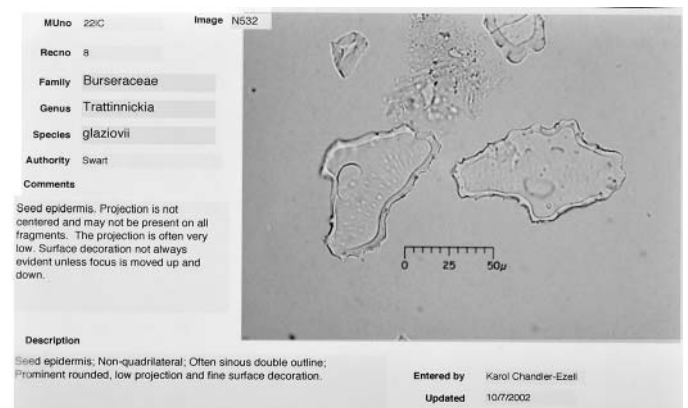
22IC photo1b.jpg



22IC card3.jpg



22IC photo2f.jpg



22IC photo3f.jpg

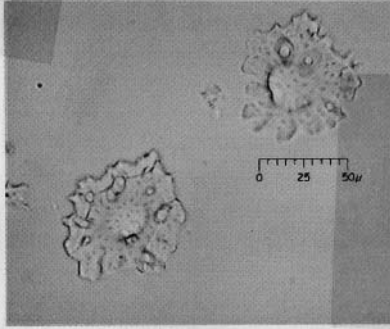
MU# 22ID Image N231 *Burseraceae* 22ID

Family Burseraceae  
Genus Protium  
Species fimbriatum

Comments  
see other rotations to get an idea of the three-dimensional shape. This body is very tall with a very ruffled or undulating edge.

Description  
Epidermal non-quadrilateral cells  
Projections on both sides, large rounded central projection on one side.  
Undulating circular shape forms a "brim" around the central projection.

Entered by Karol Chandler-Ezell  
Date 5/8/2002



22ID photo1.jpg

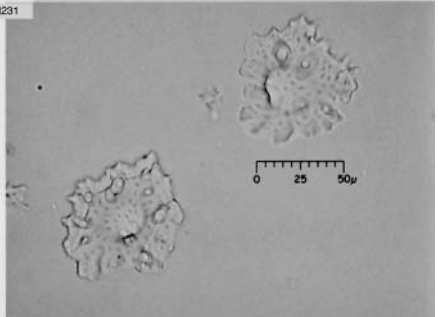
MU# 22ID Image N231

Recno 162  
Family Burseraceae  
Genus Protium  
Species fimbriatum  
Authority Swart

Comments  
See other rotations (Records 163 and 164) to get an idea of the three-dimensional shape. This body is very tall with a very ruffled or undulating edge.  
Diagnostic level: family

Description  
- Epidermal non-quadrilateral cells  
- Projections on both sides  
- Large rounded central projection on one side  
- Undulating circular shape forms a "brim" around the central projection

Entered by Karol Chandler-Ezell  
Updated 10/7/2002



22ID photo2.jpg


ULMACEAE  
CELTIS  
SCHIPPPII

20. Epidermal Non-Quadrilateral [20IAa2]  
new #: 22IE 2/05

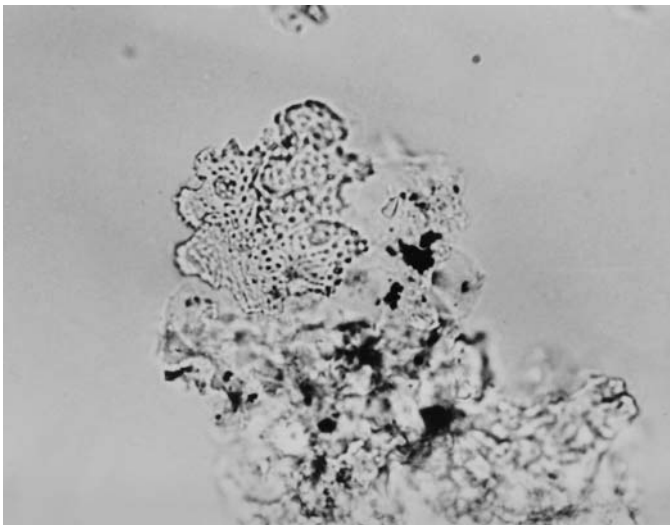
- Anticlinal cells
- Surface with projections or perforations
- Not double outline
- Sinuous shape
- Surface looks as dark dot

Occurs in Ulmaceae: Celtis schippii fruit (A)

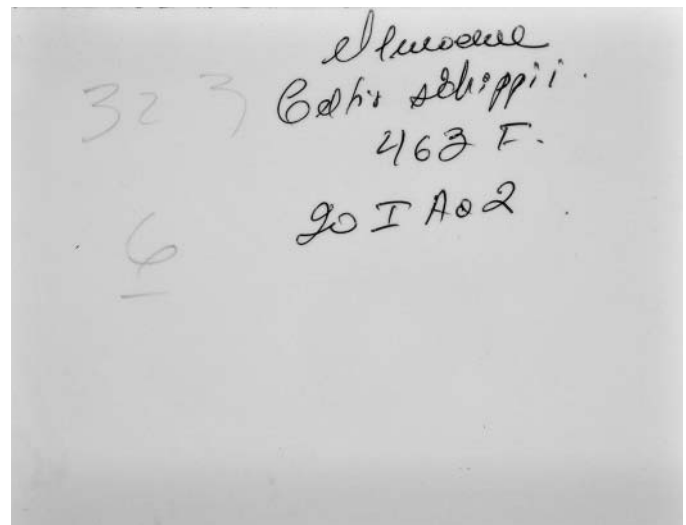
May, 24/1991  
CIVB



22IE card1.jpg



22IE photo1f.jpg



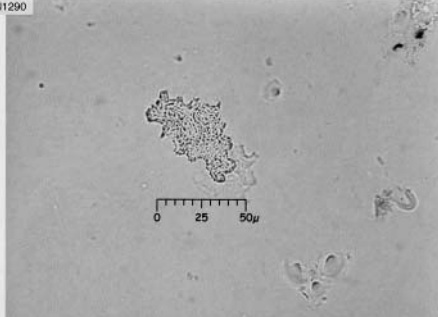
22IE photo1b.jpg

MU# 22IE Image N1290

Recno  
Family Ulmaceae  
Genus Celtis  
Species schippii  
Authority  
Comments  
Occurs in fruit. Type defined by Cesar Ventimilla 05/1991.  
Diagnostic level: species

Description  
Epidermal non-quadrilateral; Anticlinal cells; Surface with projections or perforations; Not double outline; Sinuous shape.

Entered by Meghan O'Brien  
Updated 2/22/2005



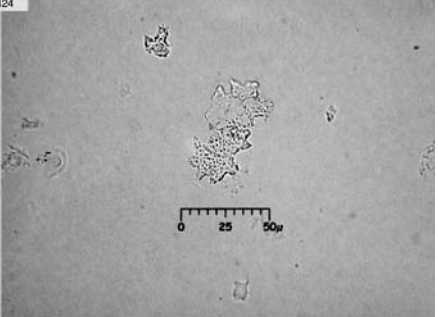
22IE photo2f.jpg

MU# 22IE Image N424

Recno 64  
Family Ulmaceae  
Genus Celtis  
Species schippii  
Authority Standl.  
Comments  
Seed or fruit epidermal cells.  
Diagnostic level:

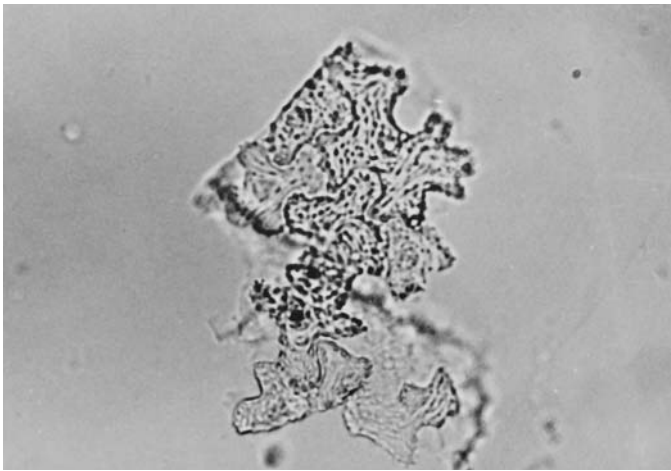
Description  
- Seed epidermis  
- Anticlinal cells  
- Surface with projections or perforations (appear to be dark spots or dots)  
- No double outline

Entered by Karol Chandler-Ezell  
Updated 3/1/2005

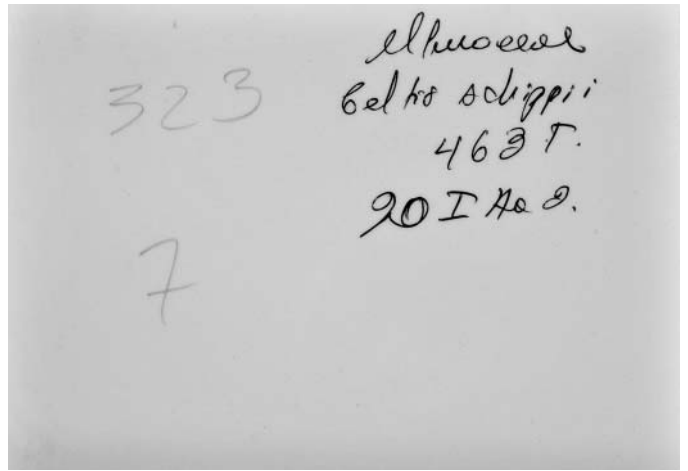


22IE photo3f.jpg

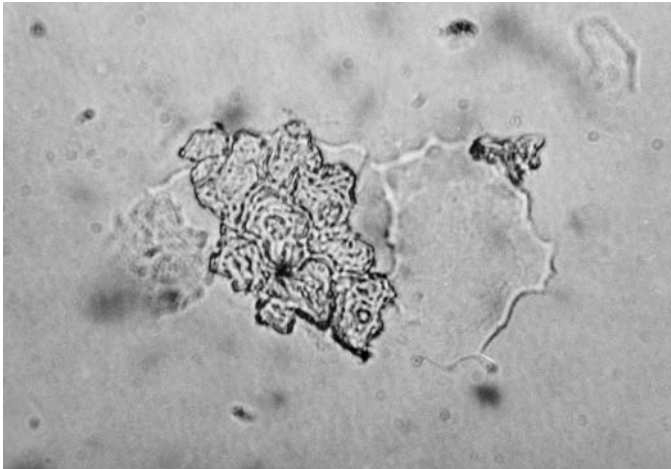




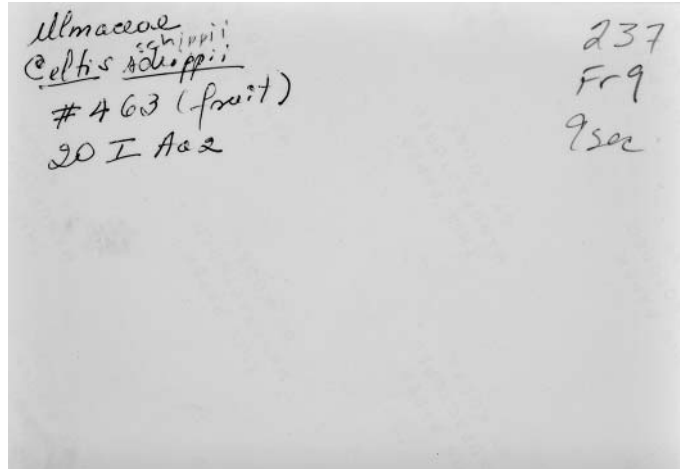
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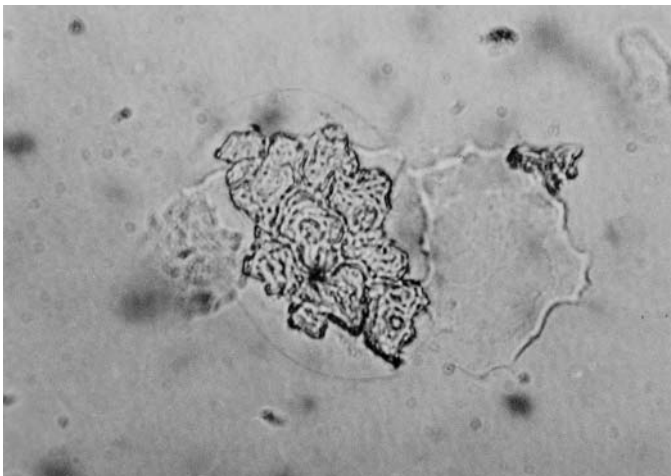
22IE photo4b.jpg



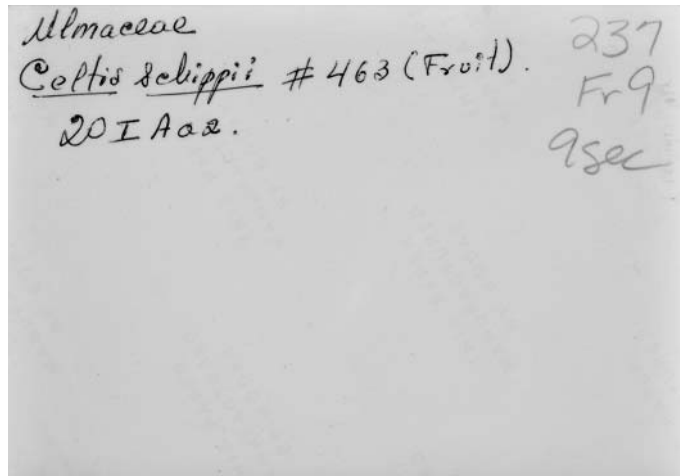
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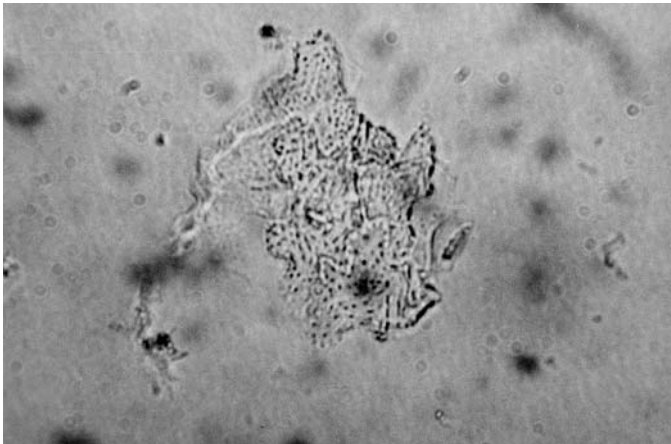
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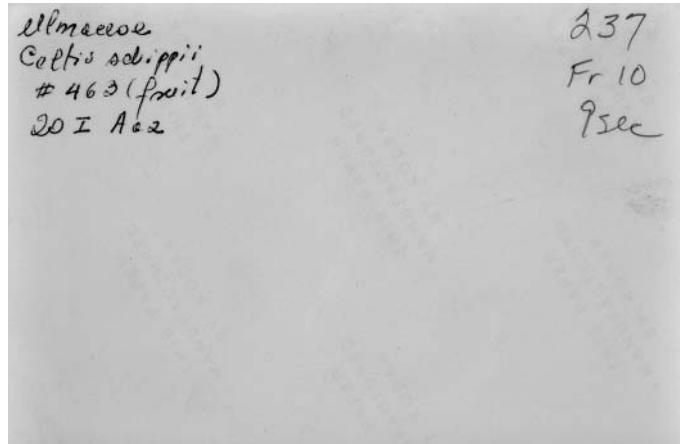
22IE photo6f.jpg



22IE photo6b.jpg

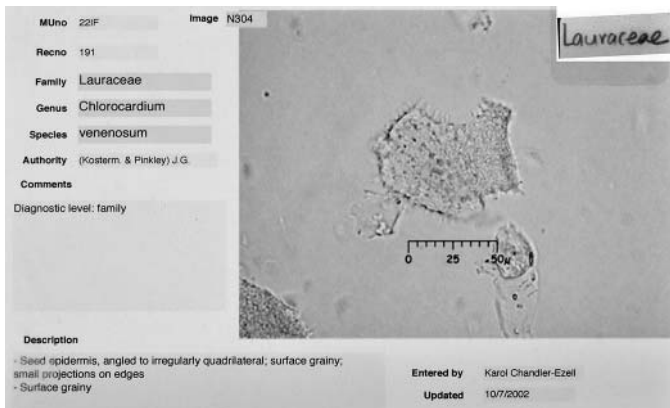


22IE photo7f.jpg

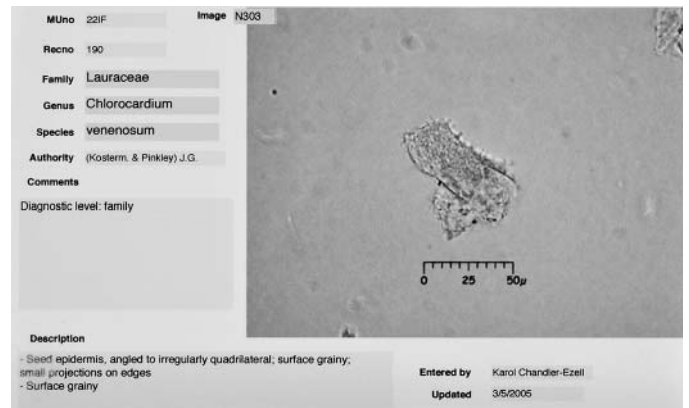


22IE photo7b.jpg

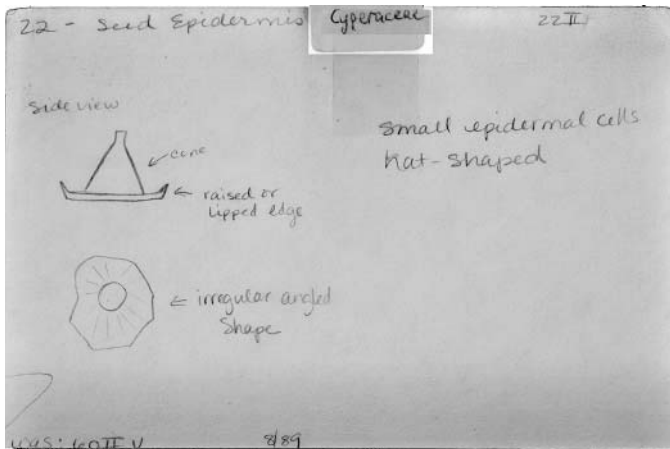




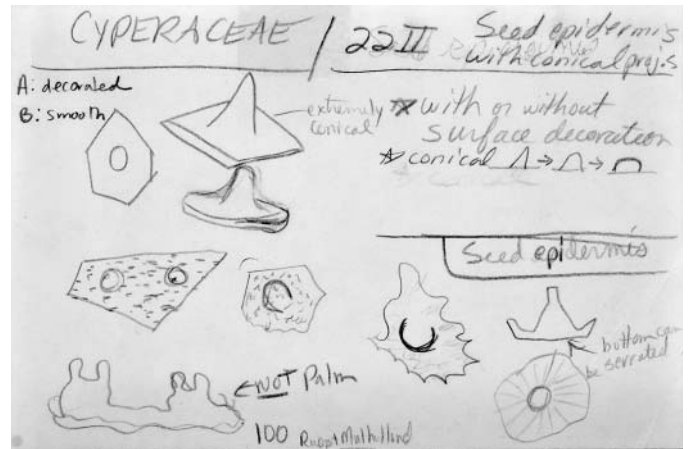
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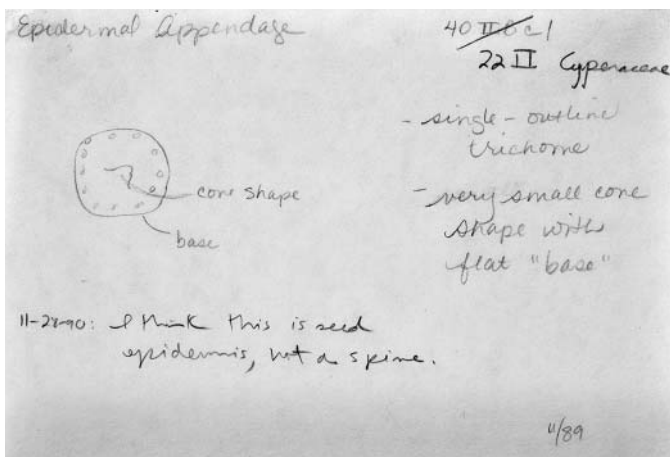
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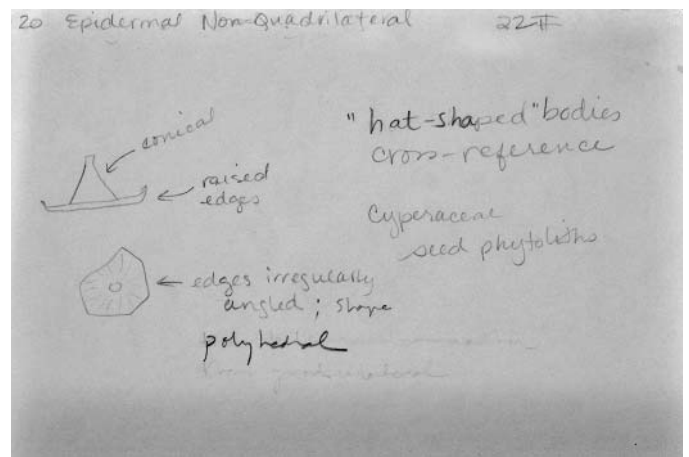
22II card1.jpg



22II card2.jpg



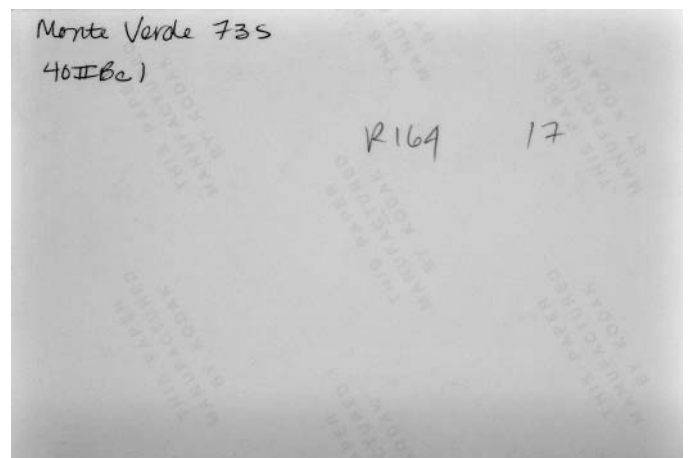
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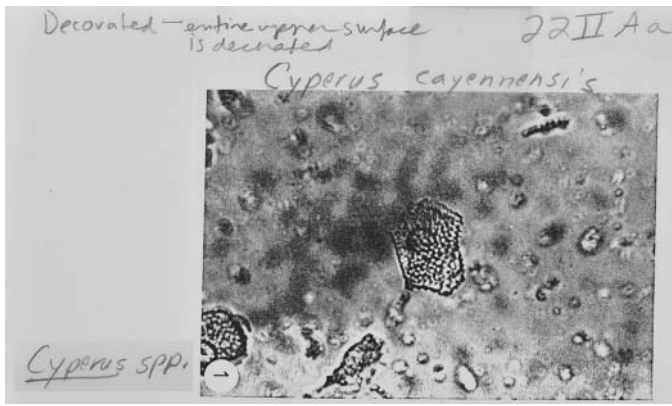
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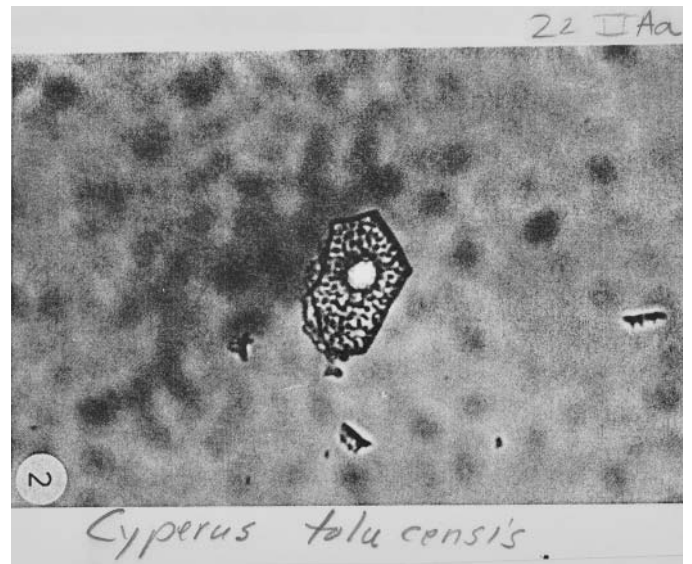
40IIBcI photo1f.jpg



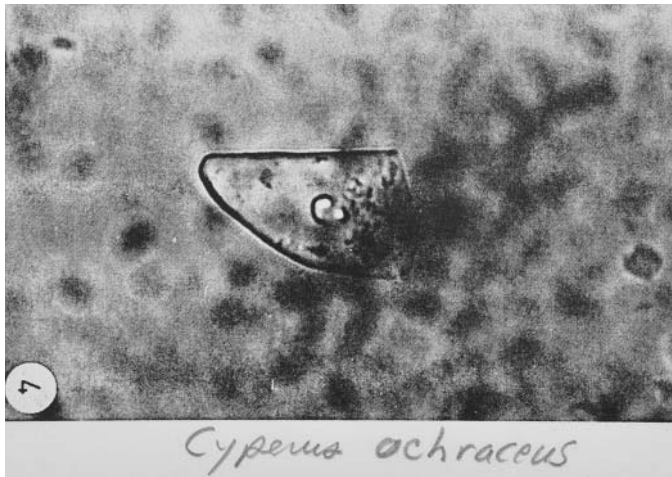
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22IIAa photo2f.jpg



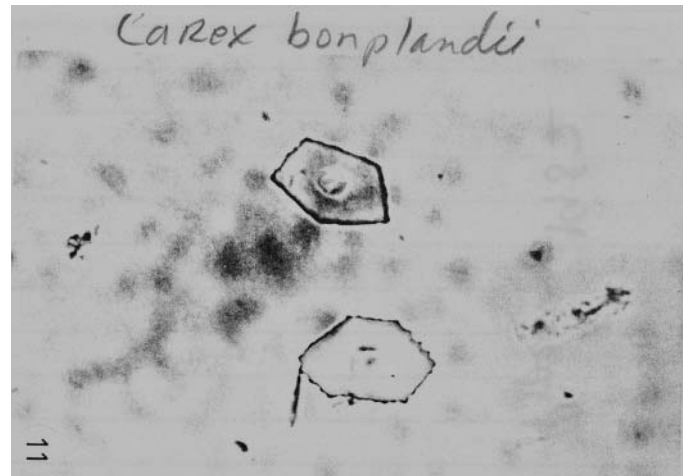
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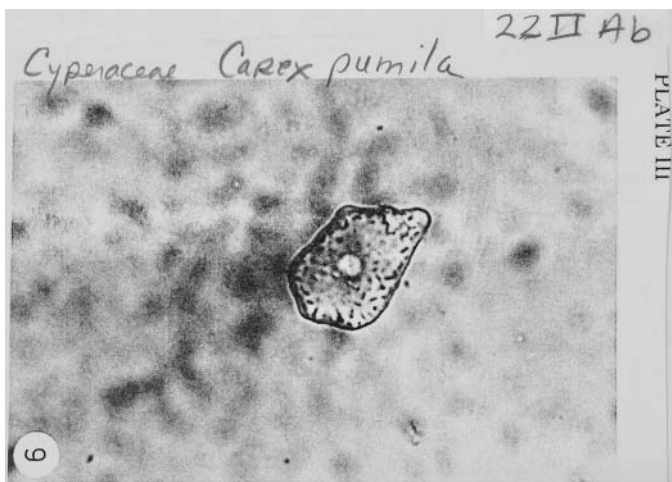
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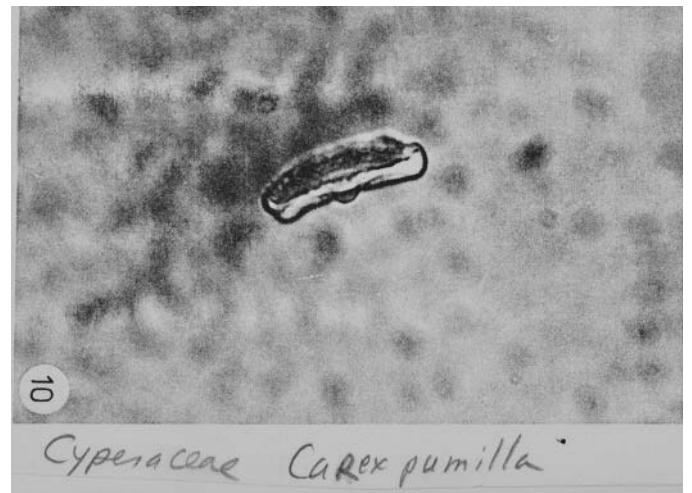
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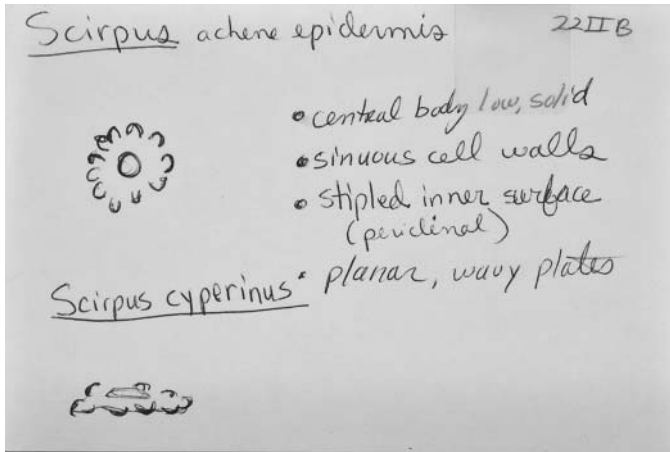
22IIAb photo2f.jpg



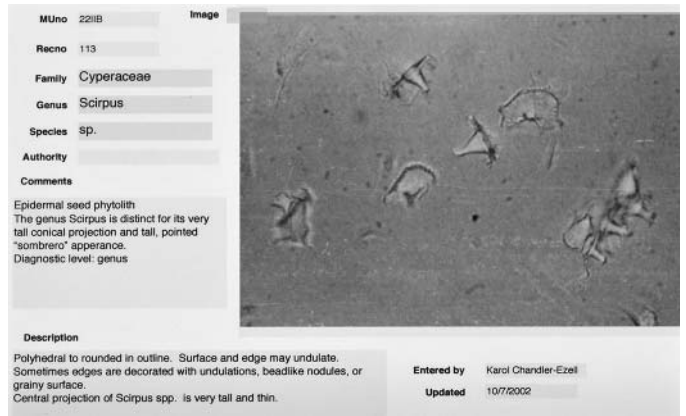
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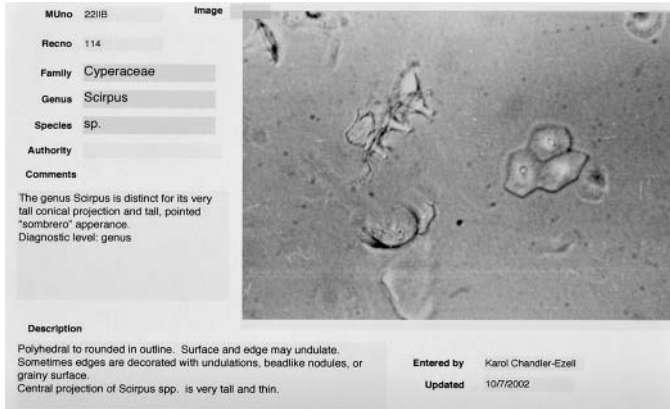
22IIAb photo4f.jpg



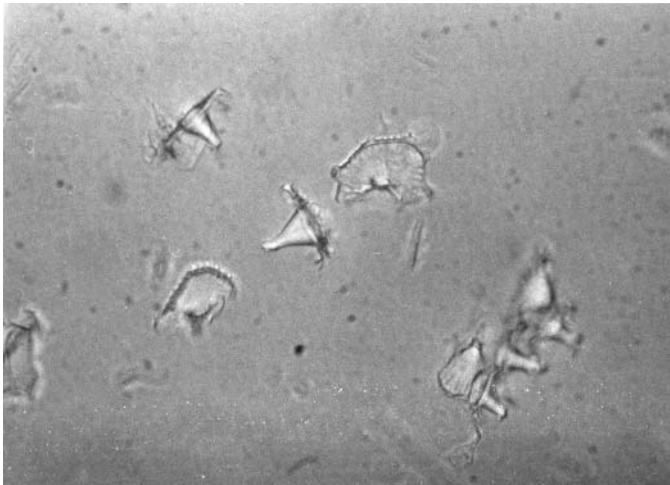
22IIB card1.jpg



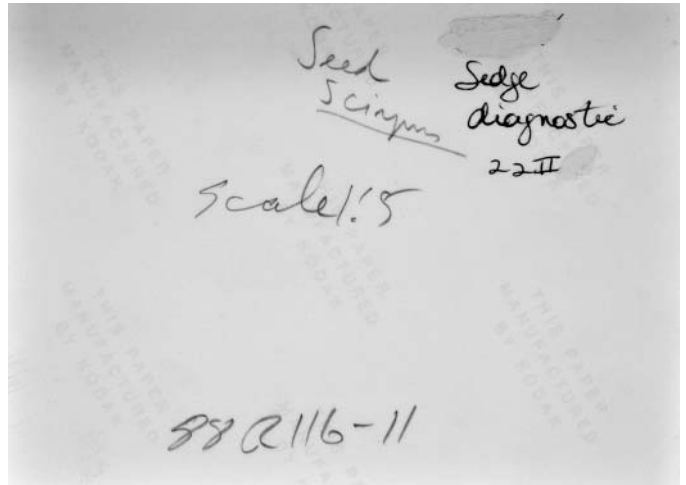
22IIB card2.jpg



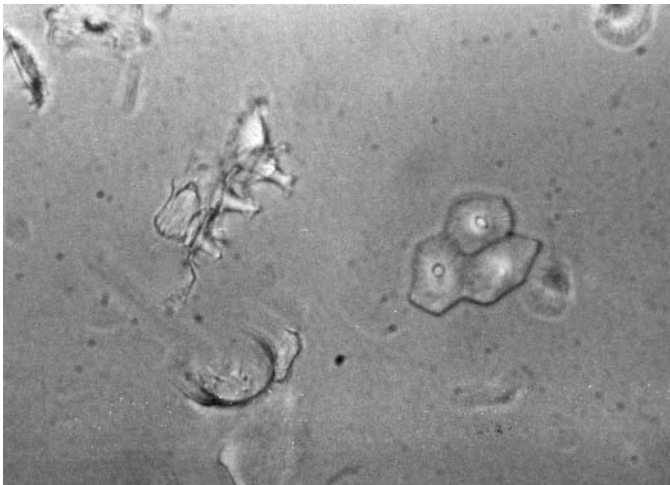
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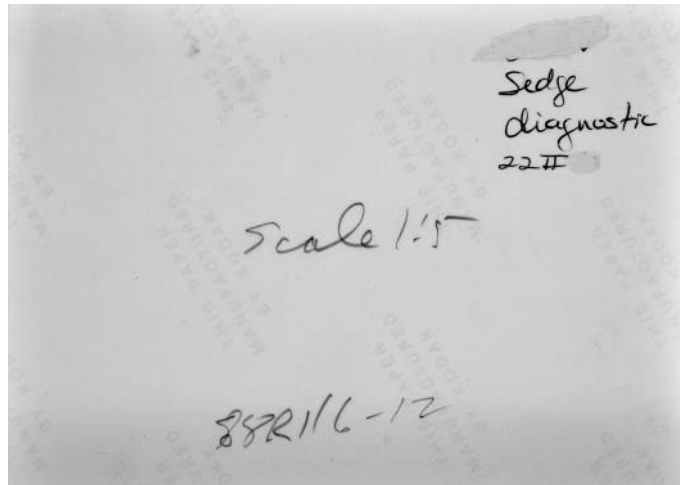
22IIB photo1f.jpg



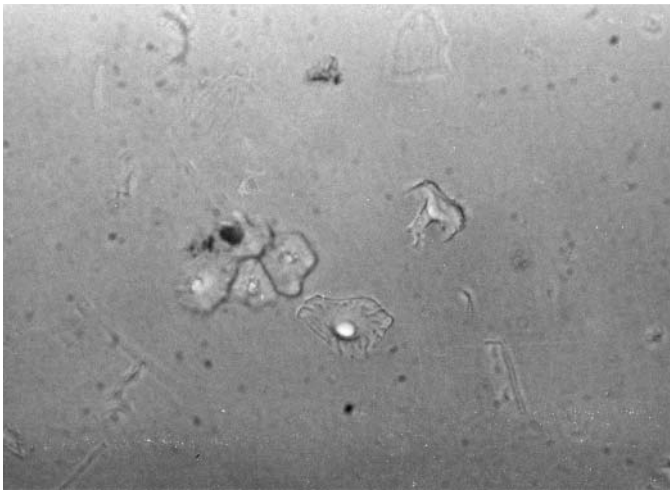
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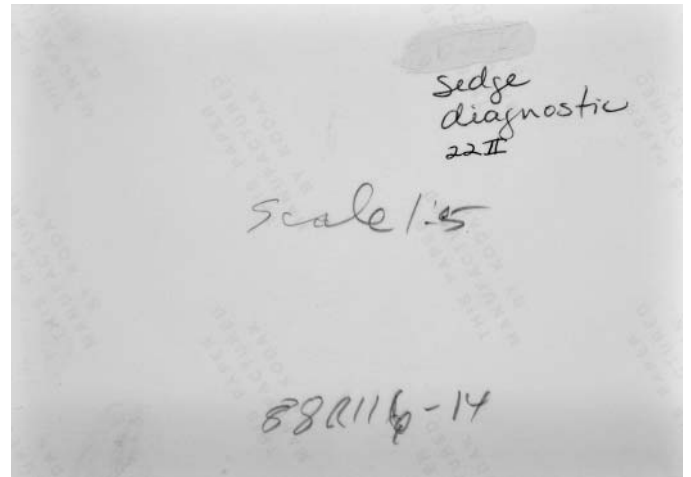
22IIB photo2f.jpg



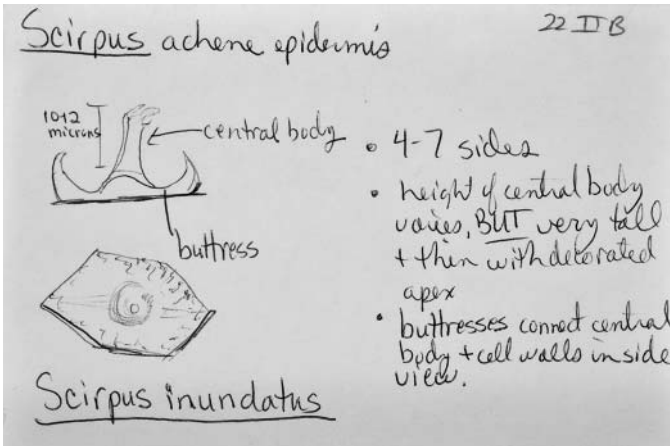
22IIB photo2b.jpg



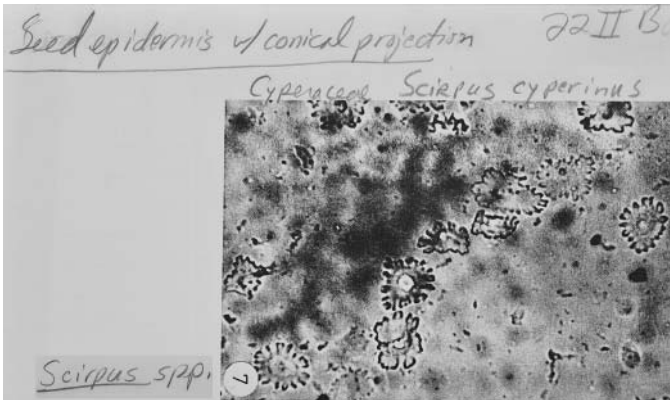
22IIB photo3f.jpg



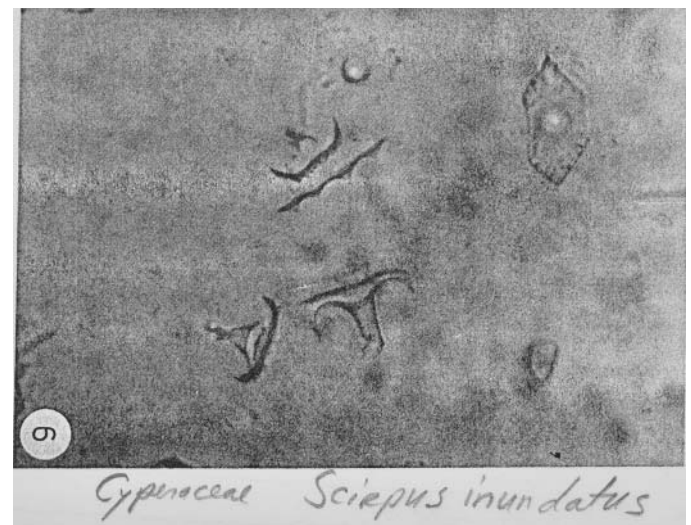
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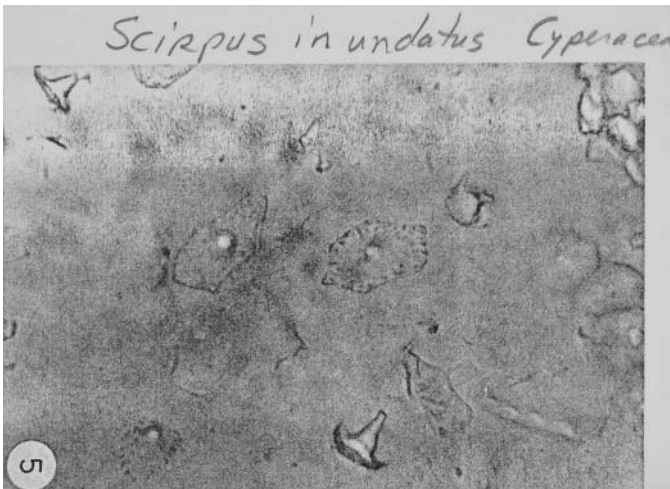
22IIB card4.jpg



22IIB photo4f.jpg

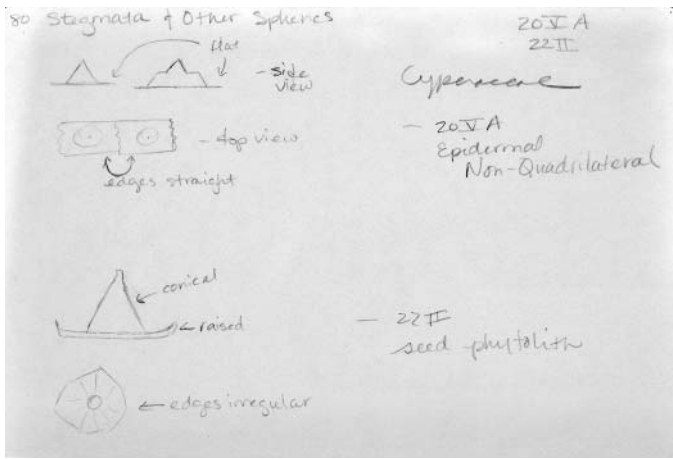


22IIB photo5f.jpg

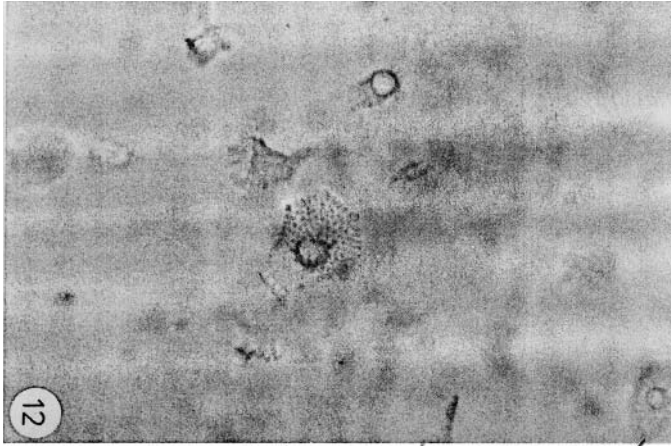


22IIB photo6f.jpg



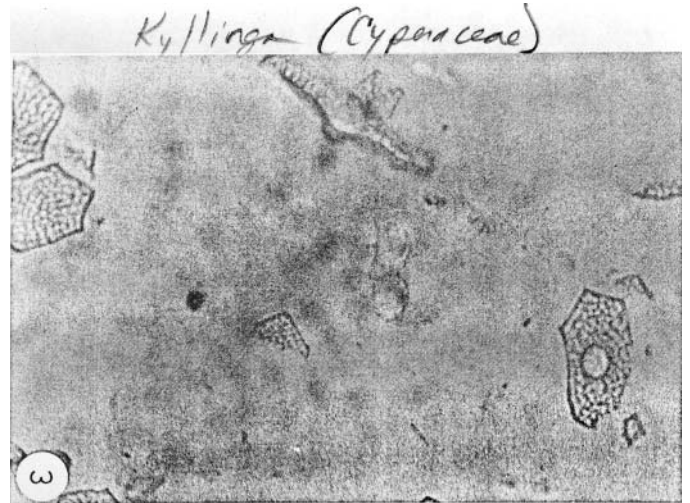


22VA card1.jpg

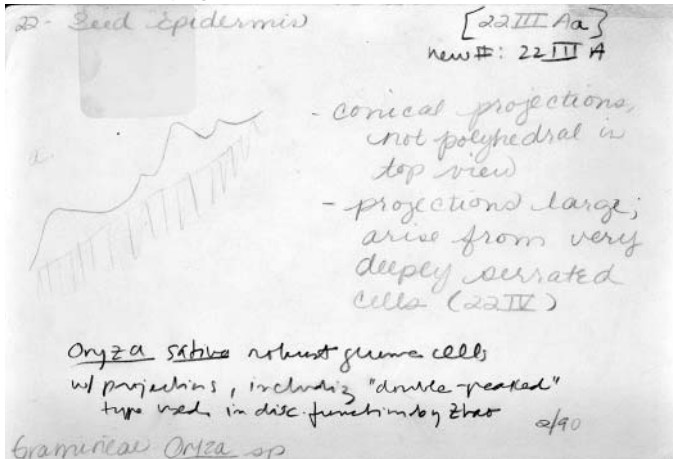


Cyperaceae *Lipocarpha maculata*

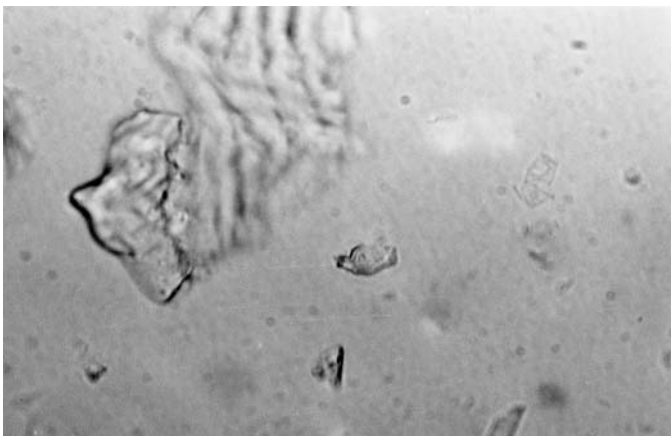
22V photo1f.jpg



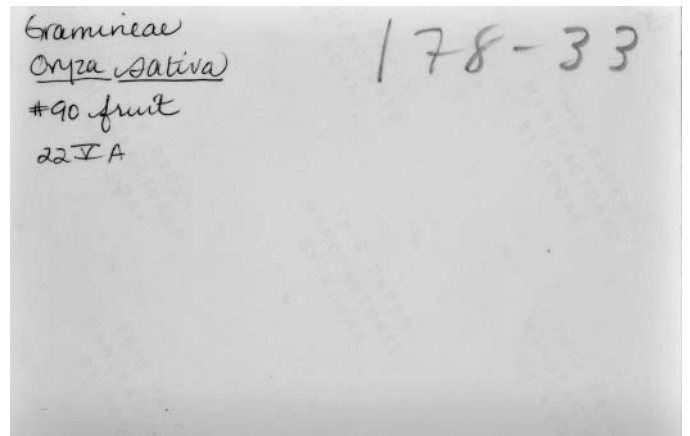
22V photo2f.jpg



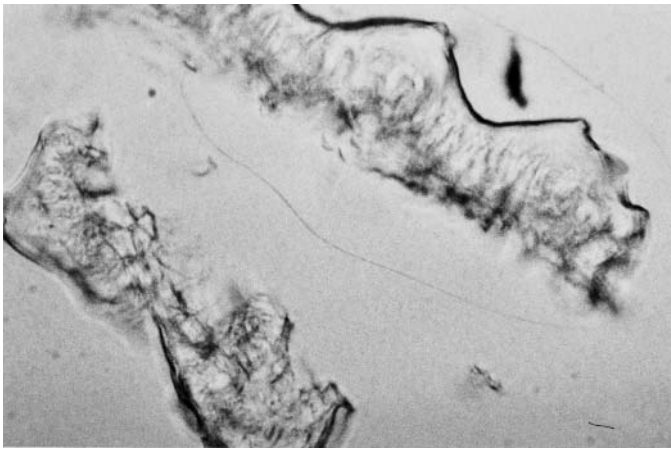
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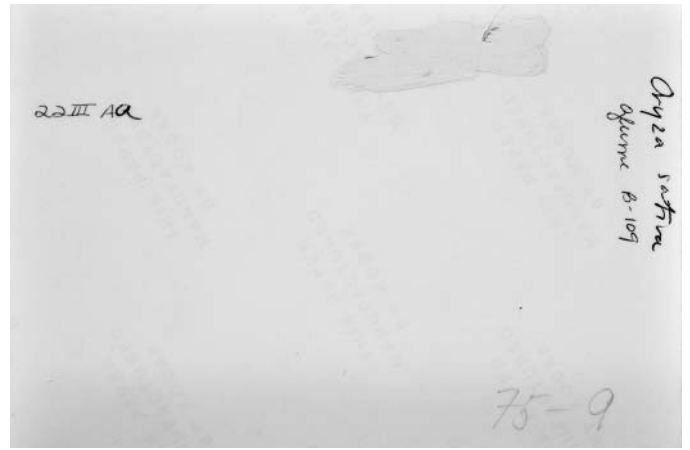
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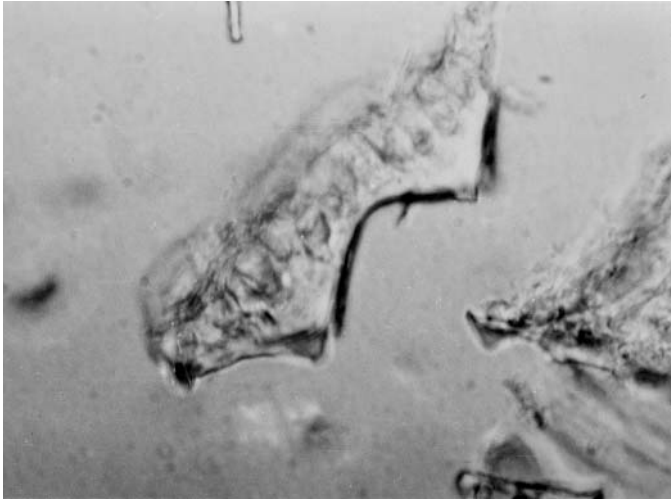
22IIIA photo1b.jpg



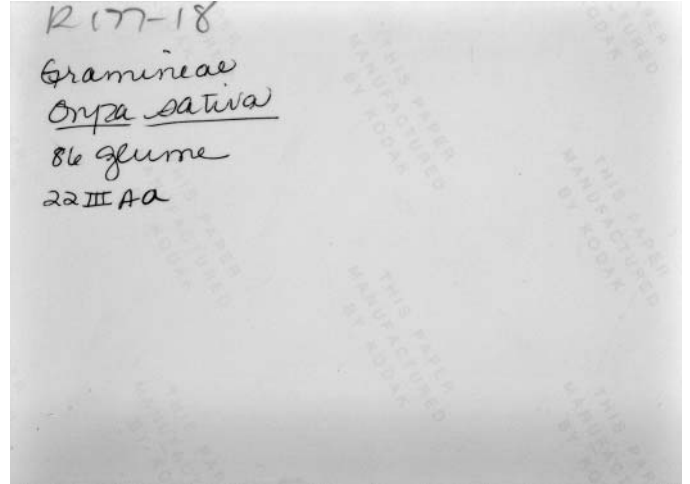
22IIIA photo2f.jpg



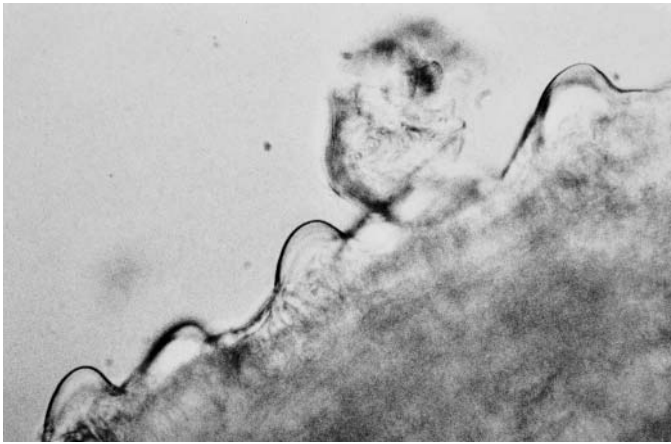
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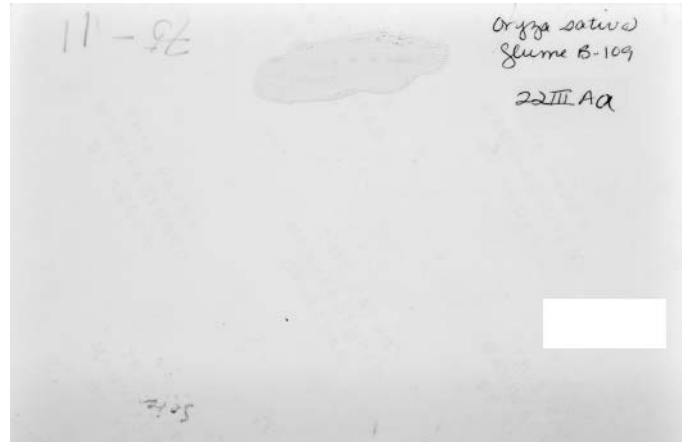
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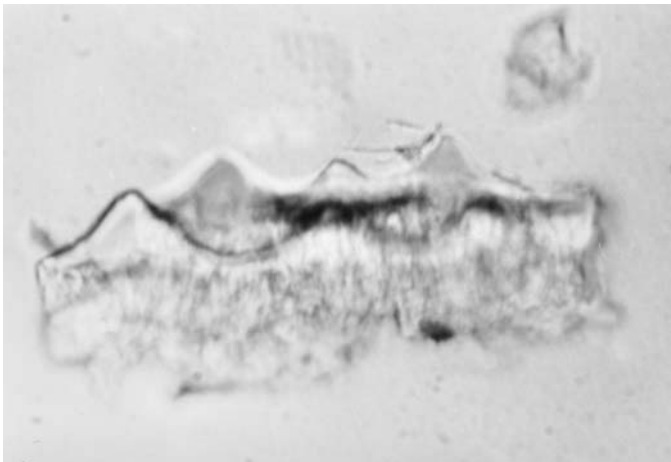
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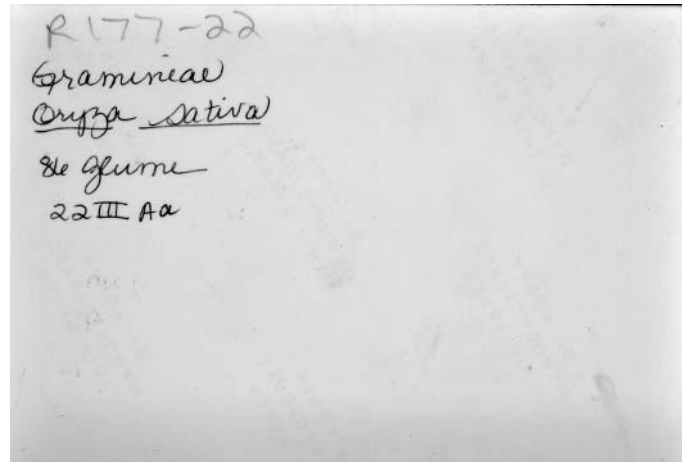
22IIIA photo4f.jpg



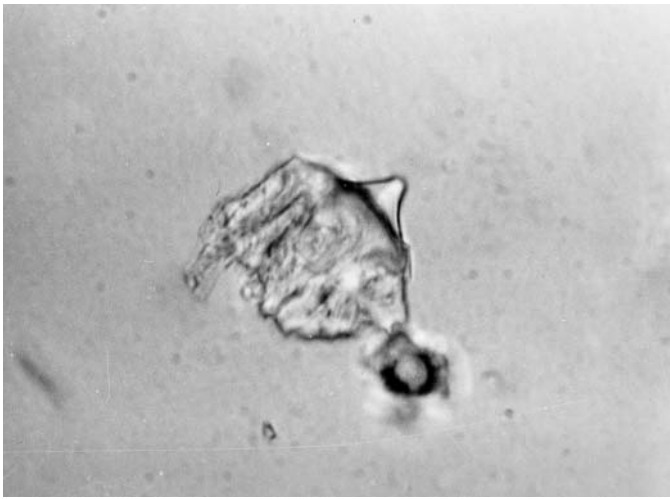
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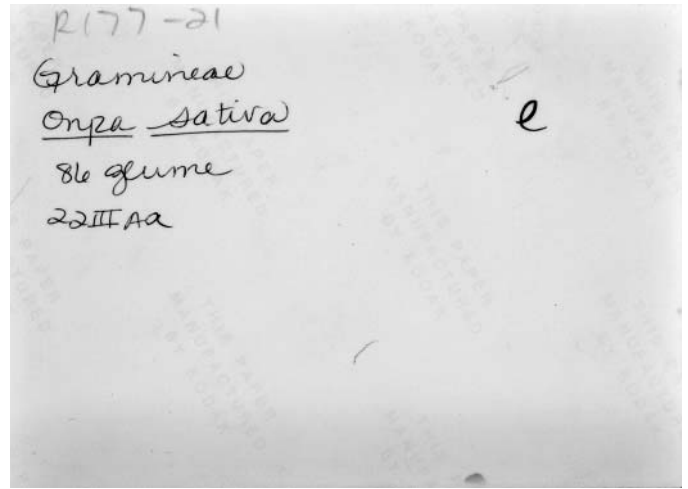
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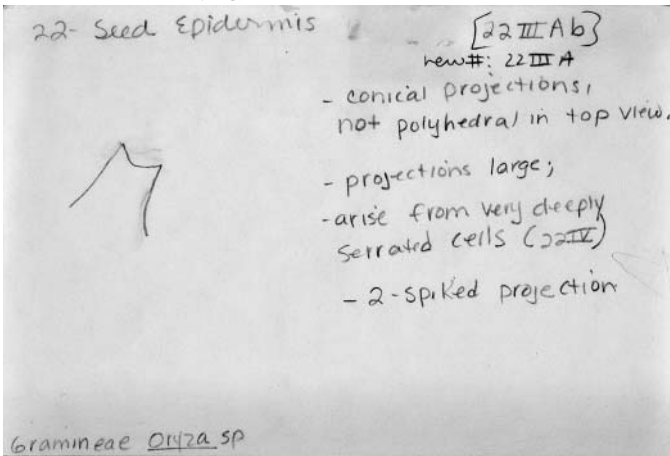
22IIIA photo5b.jpg



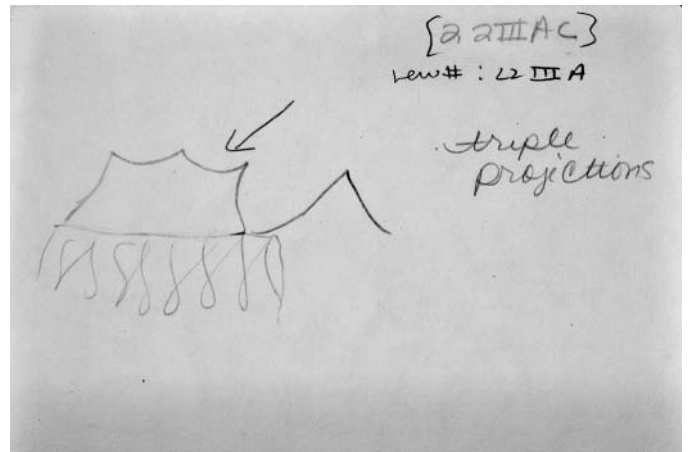
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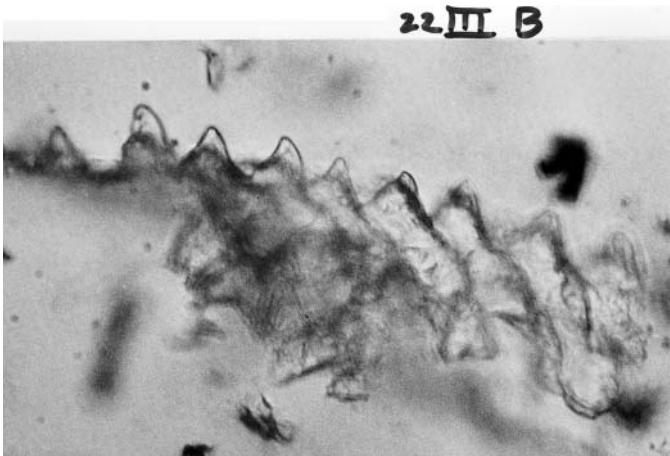
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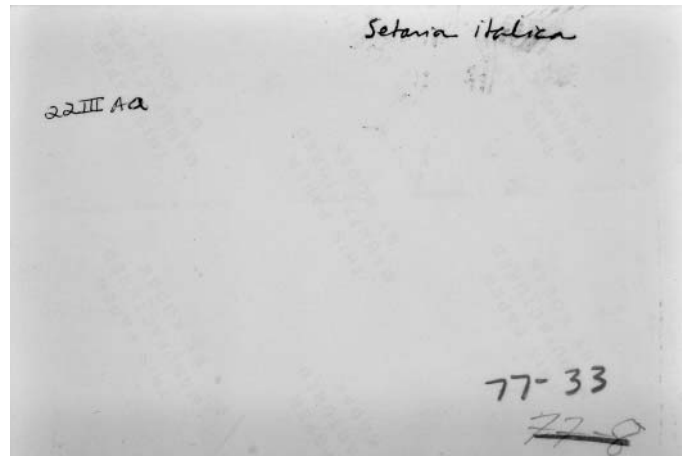
22IIIA card4.jpg



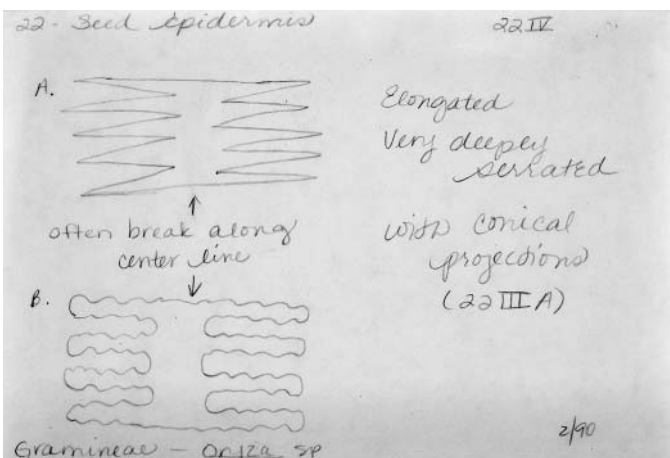
22IIIA card5.jpg



22IIIAa photo1f.jpg

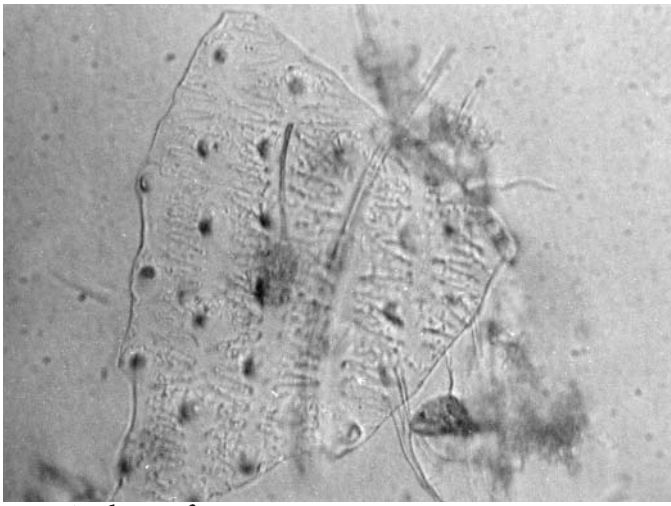


22IIIAa photo1b.jpg

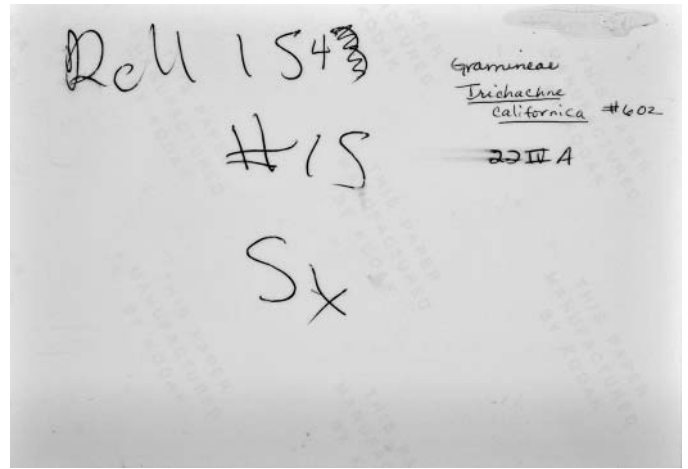


22IV card1.jpg

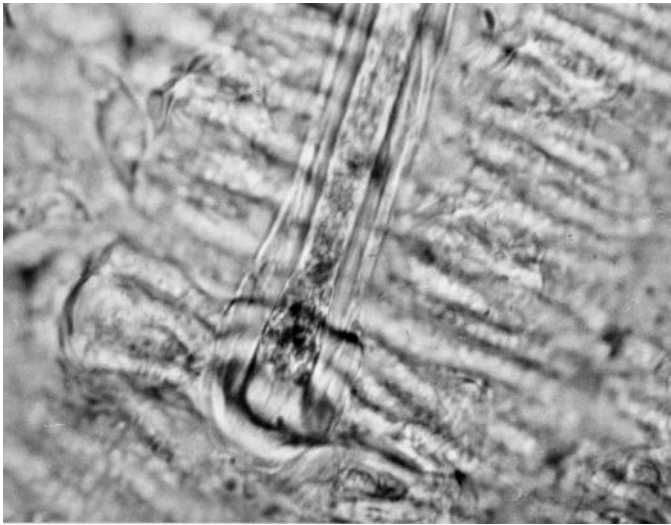




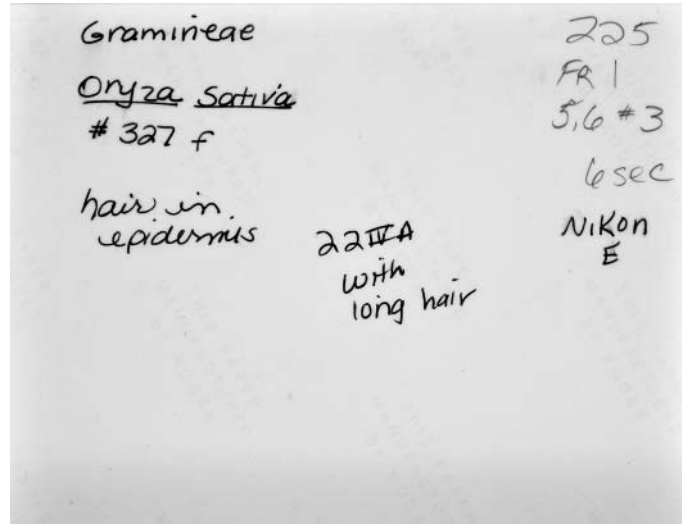
22IVA photo1f.jpg



22IVA photo1b.jpg



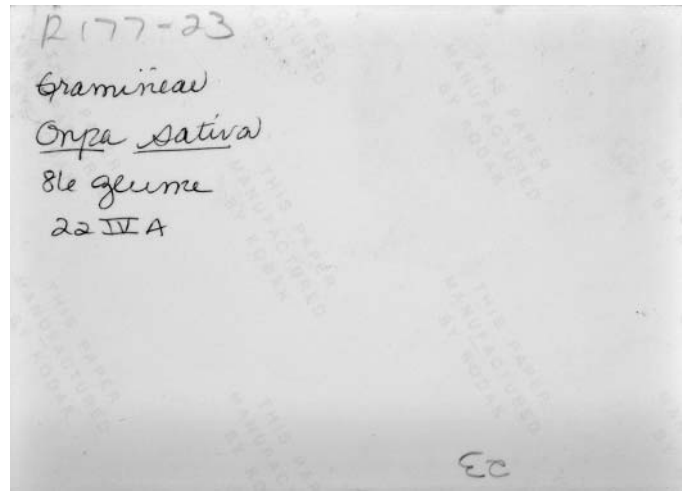
22IVA photo2f.jpg



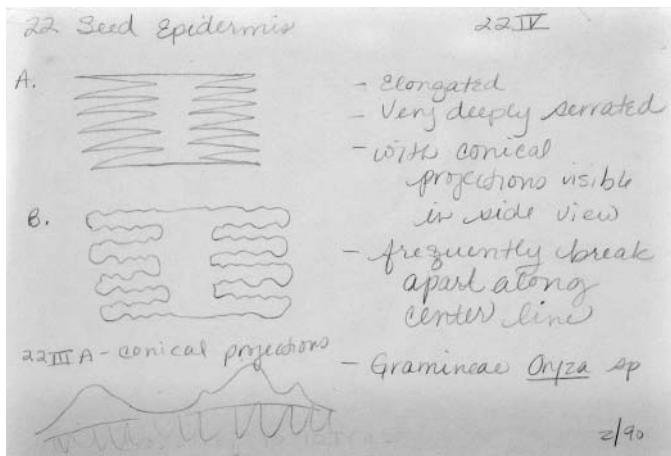
22IVA photo2b.jpg



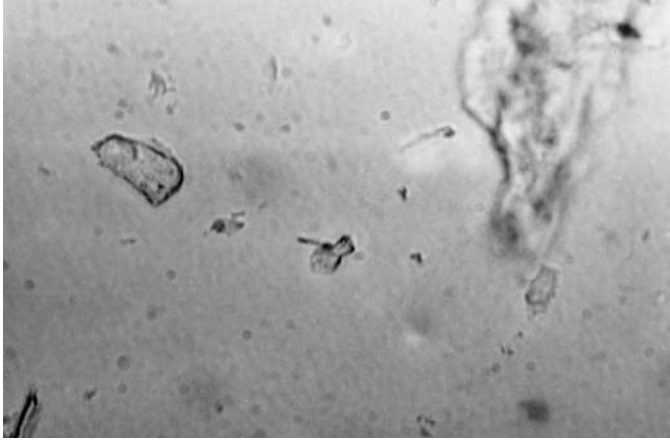
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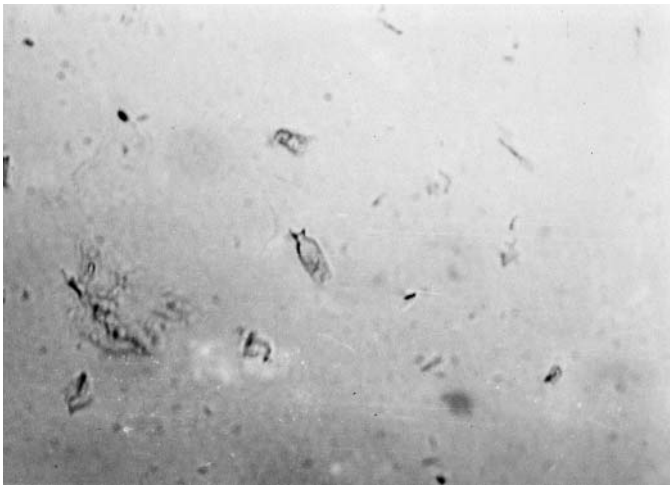
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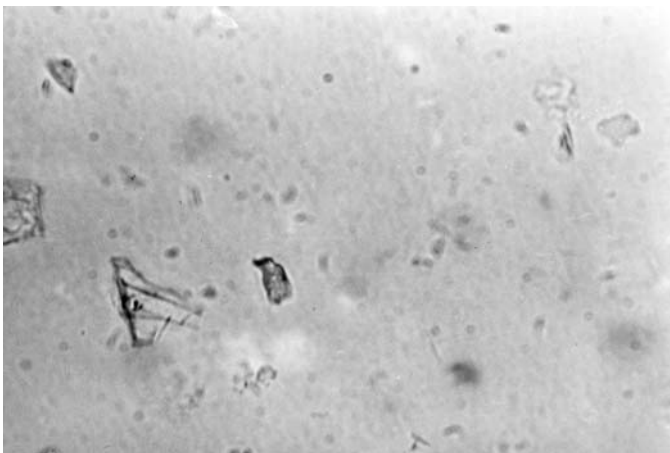
22IV card2.jpg



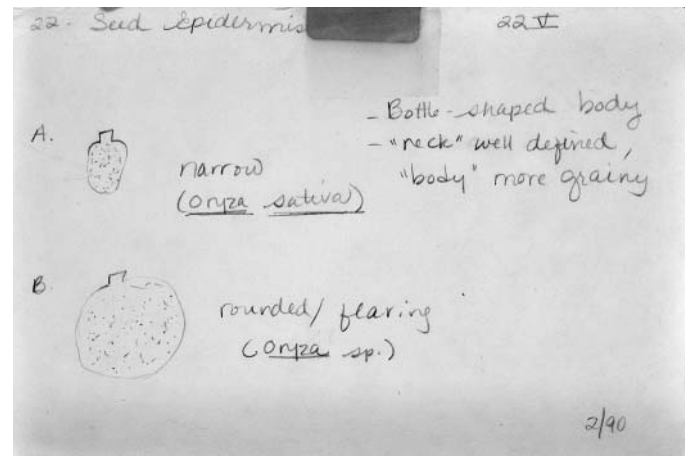
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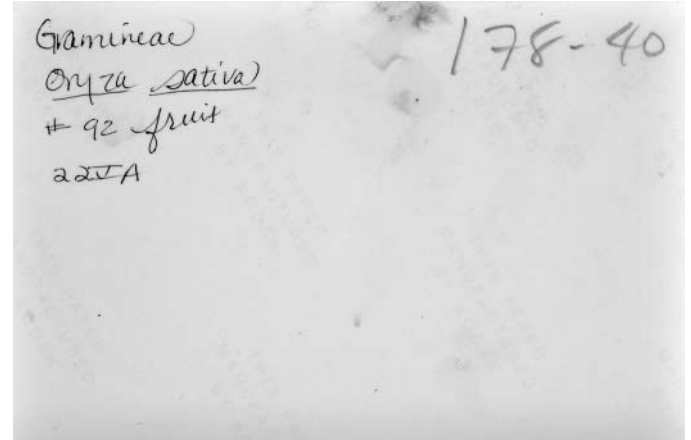
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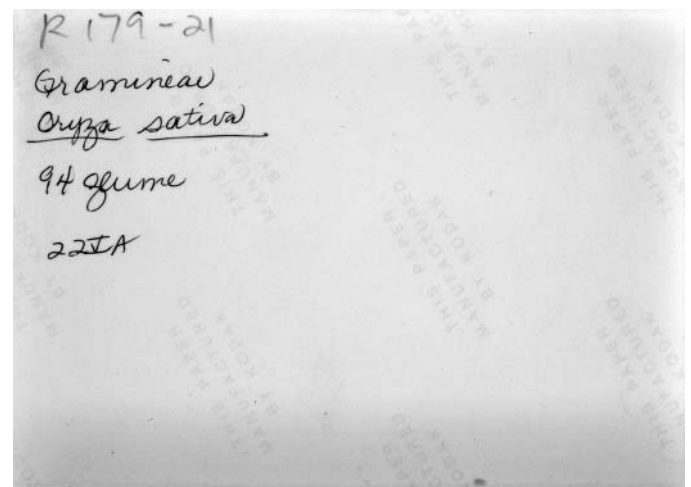
22VIA photo3f.jpg



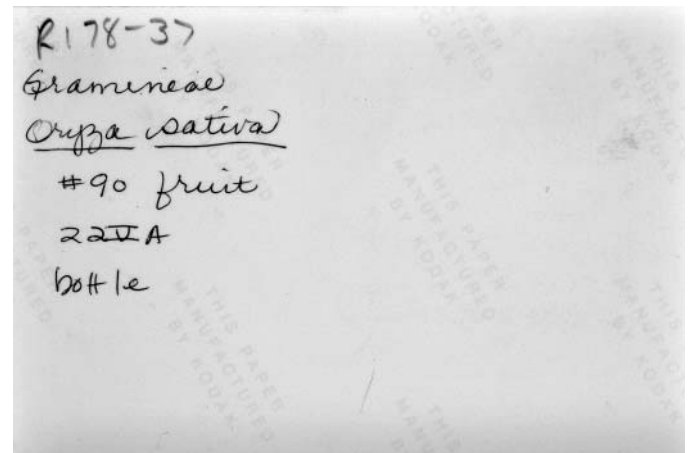
22IV card3.jpg



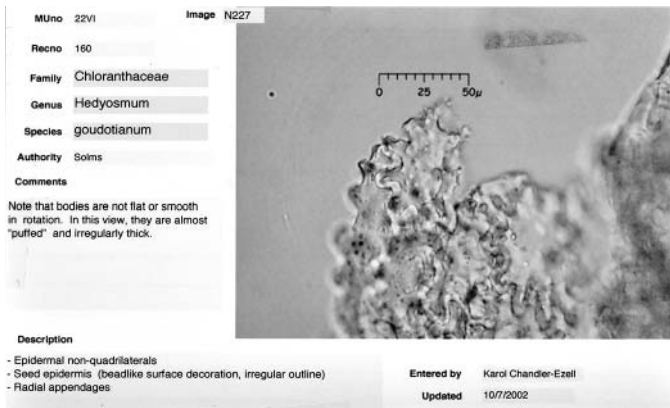
22VIA photo1b.jpg



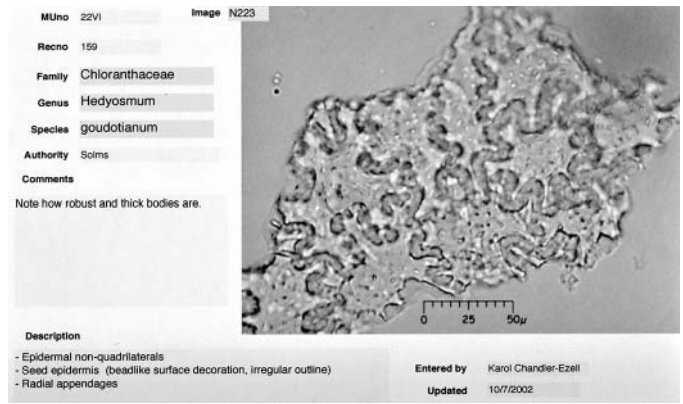
22VIA photo2b.jpg



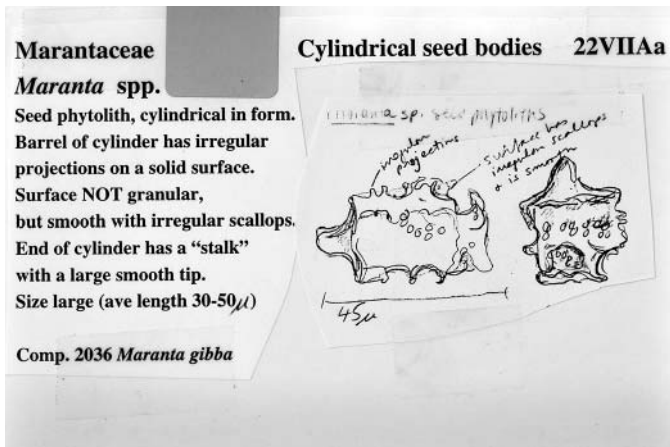
22VIA photo3b.jpg



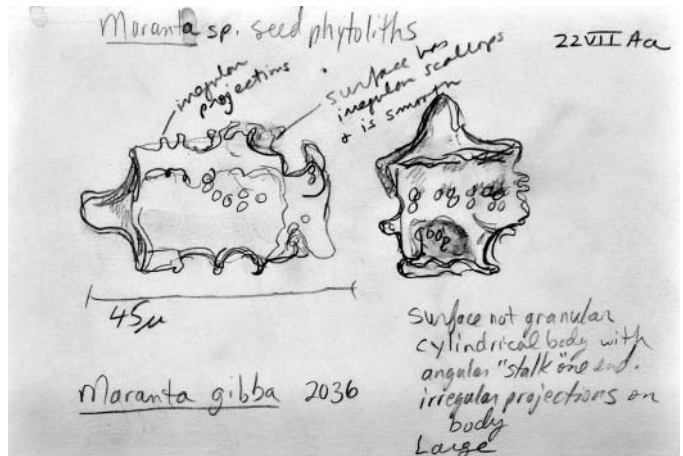
22VIIA photo4f.jpg



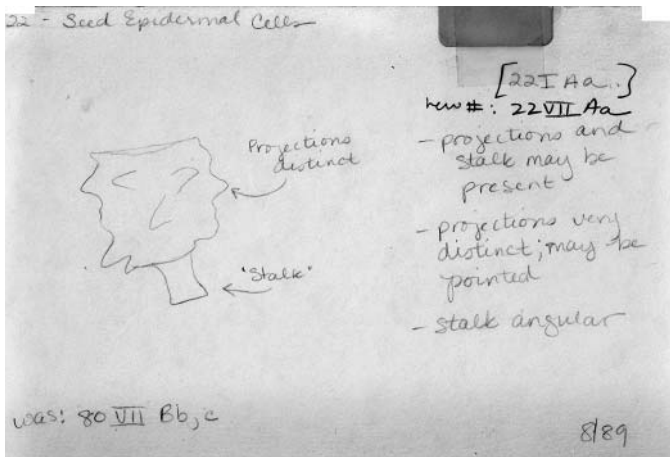
22VIIA photo5f.jpg



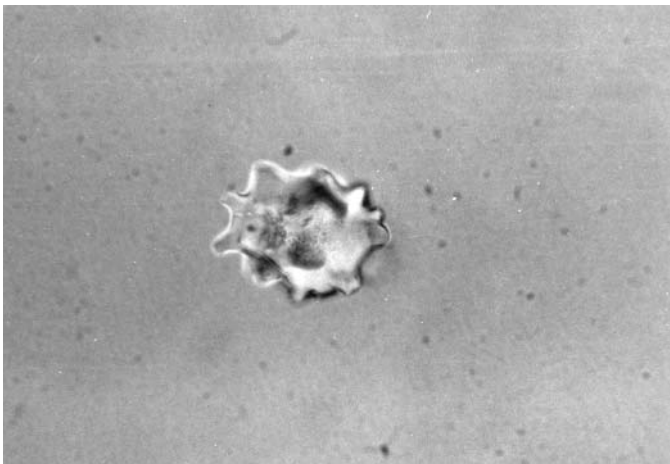
22VIIAa card1.jpg



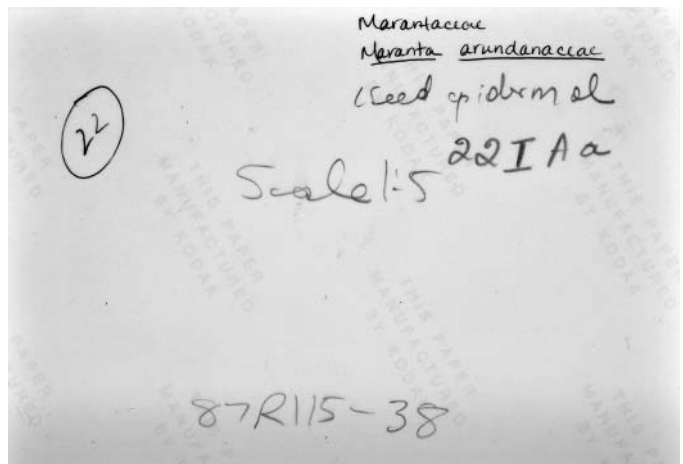
22VIIAa card2.jpg



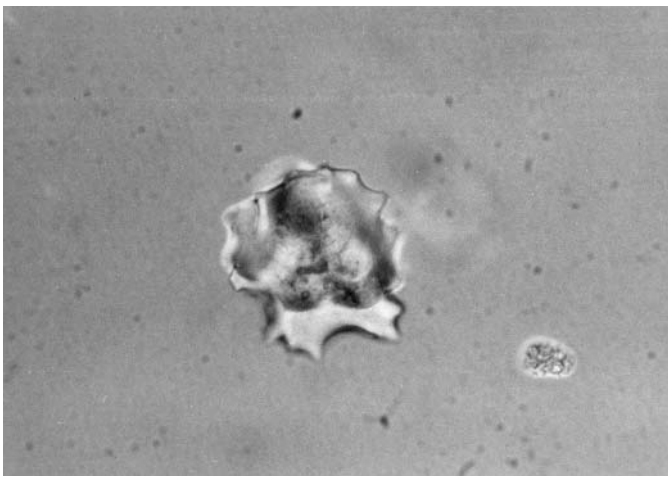
22VIIAa card3.jpg



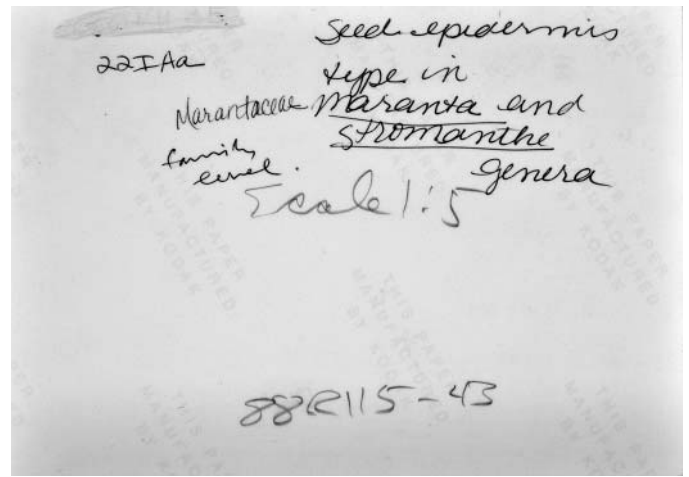
22VIIAa photo1f.jpg



22VIIAa photo1b.jpg



22VIIAa photo2f.jpg



22VIIAa photo2b.jpg

MUno 22VIIAa Image

Recno 81

Family Marantaceae

Genus Maranta

Species gibba

Authority Sm. in Rees

Comments

Size range in length: 25 - 55 microns

Note: may occur in all Maranta spp., including Maranta arundinacea

Diagnostic level: genus

Description

- Seed phytolith, cylindrical in form.
- Barrel of cylinder has irregular projections on a solid surface.
- Surface NOT granular, but smooth with irregular scallops.
- End of cylinder has a "stalk" with a large smooth tip.
- Size large: average length 30-50 microns.

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Updated 10/7/2002

22VIIAa photo3f.jpg

MUno 22VIIAa Image

Recno 80

Family Marantaceae

Genus Maranta

Species gibba

Authority Sm. in Rees

Comments

Small, "incomplete" seed body. Note absence of "tip" or "stalk" typical of the body... only a tiny or vestigial stalk at bottom of body. This photo is to illustrate the extreme end of the type.

Diagnostic level: genus

Description

- Seed phytolith, cylindrical in form.
- Barrel of cylinder has irregular projections on a solid surface.
- Surface NOT granular, but smooth with irregular scallops.
- End of cylinder has a "stalk" with a large smooth tip.
- Size large: average length 30-50 microns.

Entered by Karol Chandler-Ezell

Updated 10/7/2002

22VIIAa photo4f.jpg

MUno 22VIIAa Image

Recno 79

Family Marantaceae

Genus Maranta

Species gibba

Authority Sm. in Rees

Comments

Maranta spp. inflorescence body. Diameter of central cylinder is 37microns wide

Note: may occur in all Maranta spp., including Maranta arundinacea

Diagnostic level: genus

Description

- Seed phytolith, cylindrical in form.
- Barrel of cylinder has irregular projections on a solid surface.
- Surface NOT granular, but smooth with irregular scallops.
- End of cylinder has a "stalk" with a large smooth tip.
- Size large: average length 30-50 microns.

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22VIIAa photo5f.jpg

Marantaceae

Cylindrical seed bodies 22VIIAb

*Maranta arundinacea*

Short cylindrical seed body with smooth-solid granular surface. Bottom & side views show broad bulbous base which varies from very irregular and flattened to polyhedral. May form a "skirt" in very shortened bodies. Stalk varies from broad to angular/pointed and in length from truncated to very long (<1/2 diameter to >1/2 total length). Size range:

22VIIAb card1.jpg

MUno 22VIIAb Image

Recno 85

Family Marantaceae

Genus Maranta

Species arundinacea

Authority L.

Comments

Note how much shorter in length cylinders are compared to Maranta spp. type -- yet "tips" are larger

Compare to other photos of this type for variation.

Diagnostic level: species

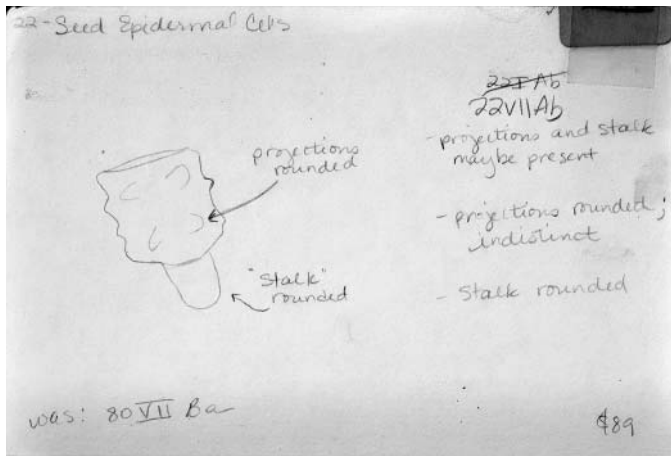
Description

- Short cylindrical seed body with smooth-to-solid granular surface.
- Bottom and side views show broad bulbous base
- Base varies from very irregular and flattened to polyhedral
- Base and stalk may fuse to form a "skirt" in very shortened bodies.
- Stalk shape varies from broad to angular/pointed

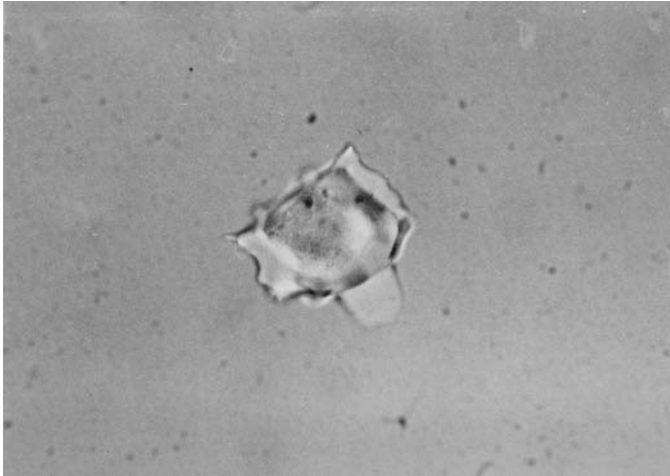
Entered by Karol Chandler-Ezell

Updated 10/7/2002

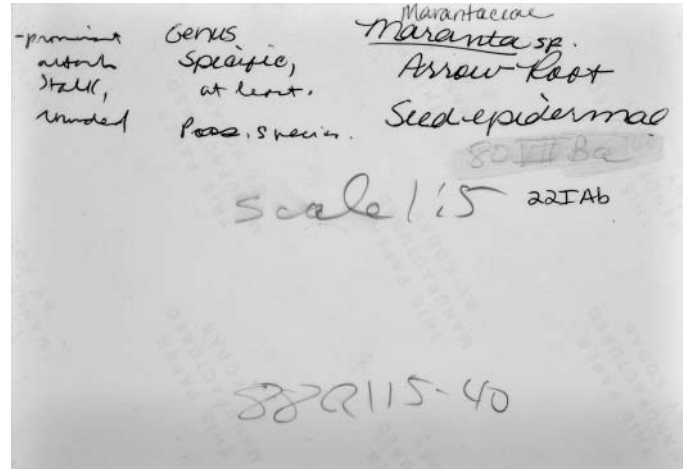
22VIIAb card2.jpg



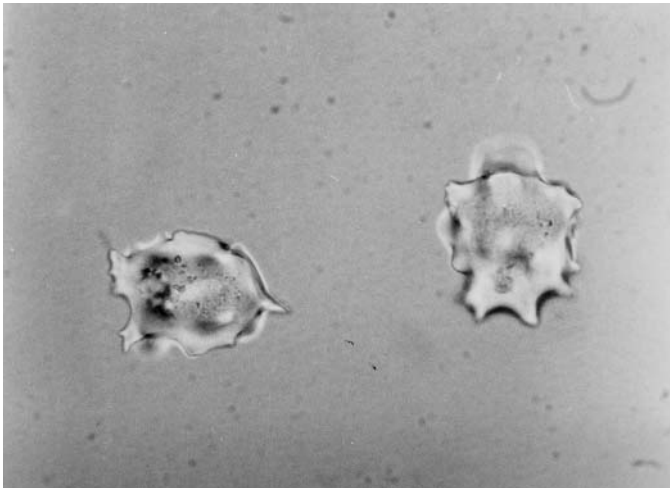
22VIIAb card3.jpg



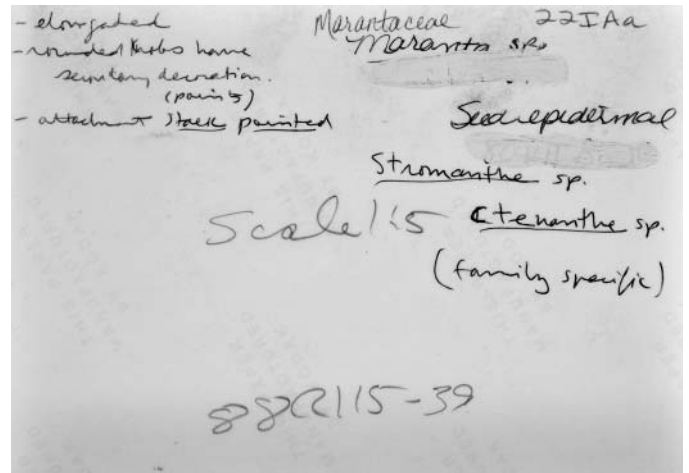
22VIIAb photo1f.jpg



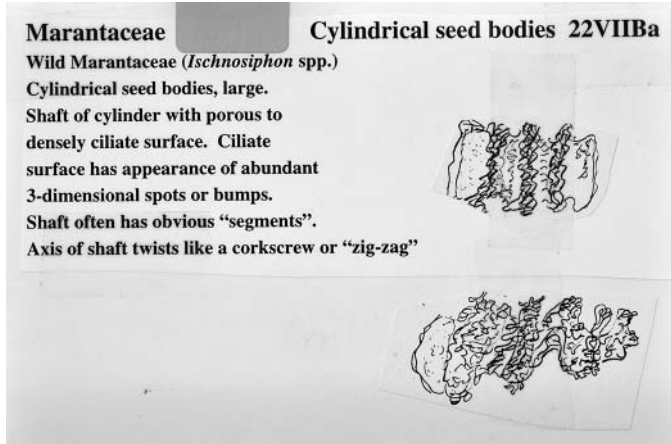
22VIIAb photo1b.jpg



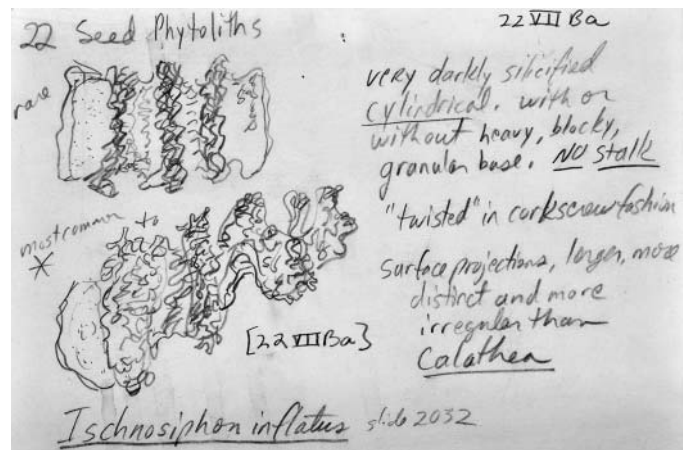
22VIIAb photo2f.jpg



22VIIAb photo2b.jpg

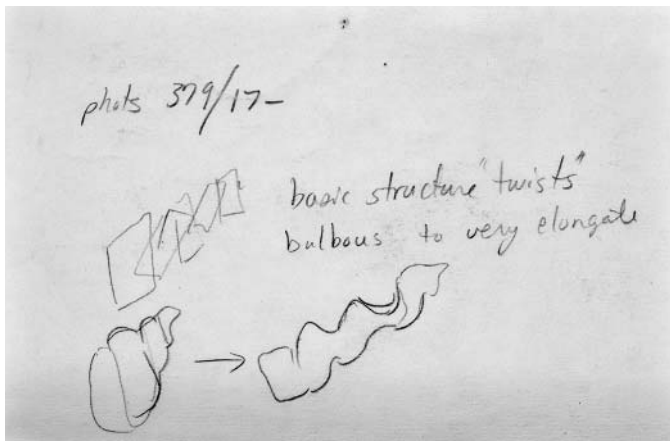


22VIIBa card1.jpg

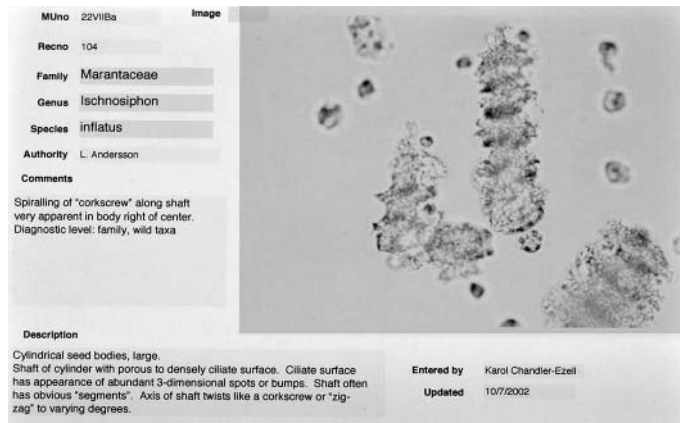


22VIIBa card2.jpg

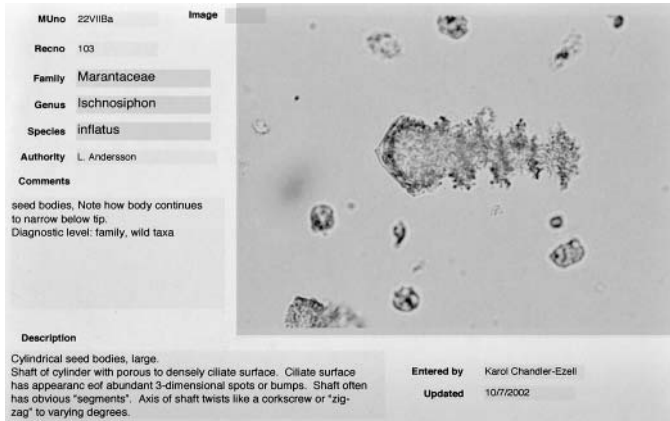




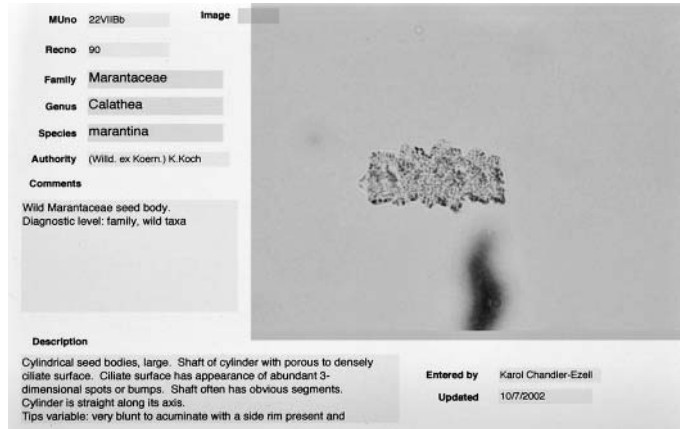
22VIIBa card3.jpg



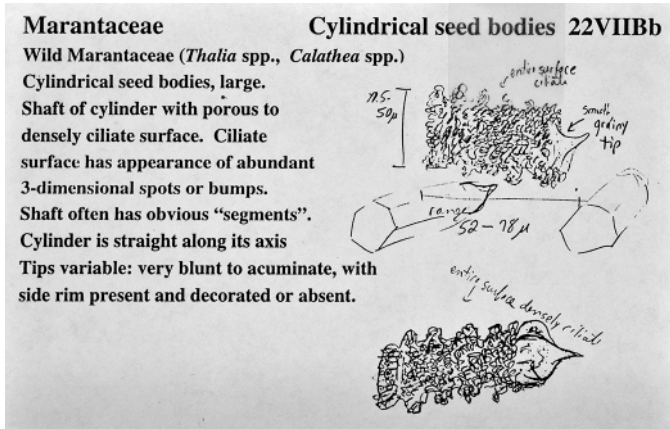
22VIIBa photo1f.jpg



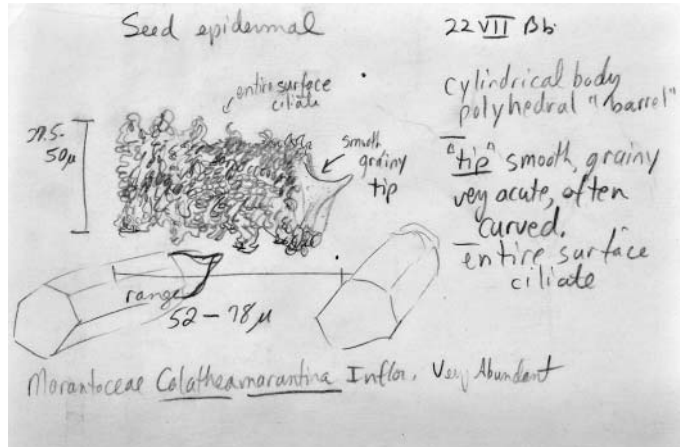
22VIIBa photo2f.jpg



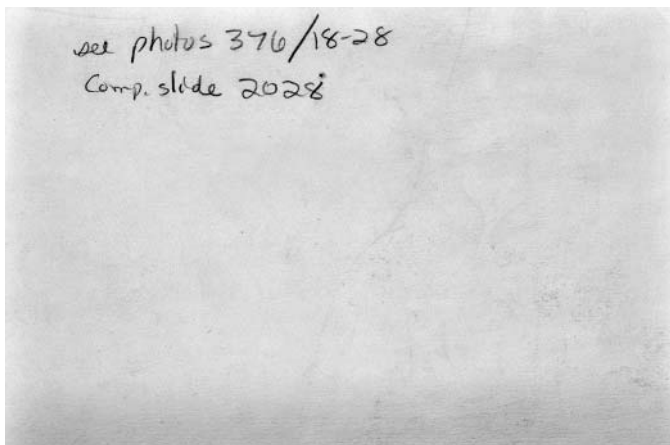
22VIIBa photo3f.jpg



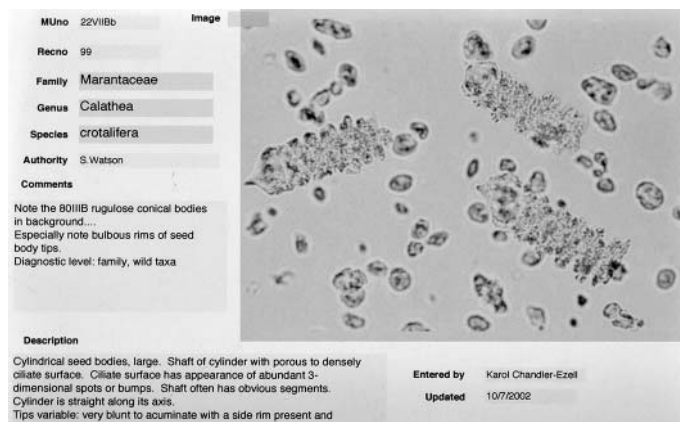
22VIIBb card1.jpg



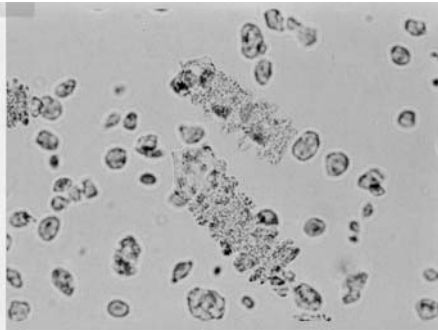
22VIIBb card2.jpg



22VIIBb card3.jpg



22VIIBb photo1f.jpg

MUno 22VIIBb  Image

Recno 100

Family Marantaceae

Genus Calathea

Species crotalifera

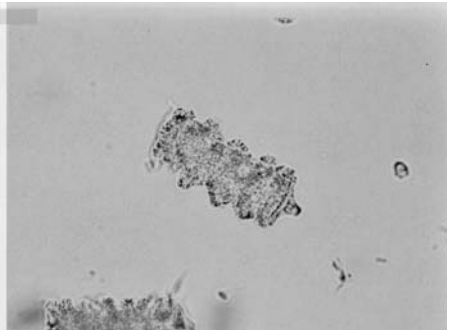
Authority S. Watson

Comments  
seed bodies, background has rugulose conical bodies  
Diagnostic level: family, wild taxa

Description  
Cylindrical seed bodies, large. Shaft of cylinder with porous to densely ciliate surface. Ciliate surface has appearance of 3-dimensional spots or bumps. Shaft often has obvious segments. Cylinder is straight along its axis.  
Tips variable: very blunt to acuminate with a side rim present and

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Updated 10/7/2002

22VIIBb photo2f.jpg

MUno 22VIIBb  Image

Recno 91

Family Marantaceae

Genus Calathea

Species marantina

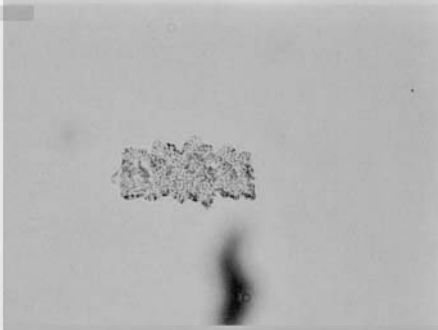
Authority (Willd. ex Koern.) K. Koch

Comments  
seed body  
Diagnostic level: family, wild taxa

Description  
Cylindrical seed bodies, large. Shaft of cylinder with porous to densely ciliate surface. Ciliate surface has appearance of abundant 3-dimensional spots or bumps. Shaft often has obvious segments. Cylinder is straight along its axis.  
Tips variable: very blunt to acuminate with a side rim present and

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22VIIBb photo3f.jpg

MUno 22VIIBb  Image

Recno 90

Family Marantaceae

Genus Calathea

Species marantina

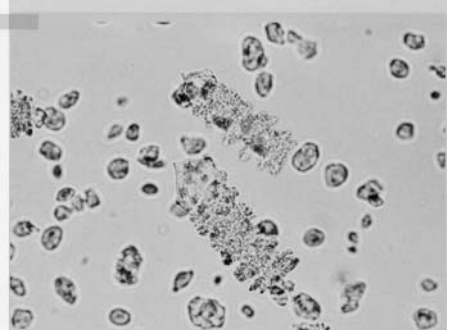
Authority (Willd. ex Koern.) K. Koch

Comments  
Wild Marantaceae seed body.  
Diagnostic level: family, wild taxa

Description  
Cylindrical seed bodies, large. Shaft of cylinder with porous to densely ciliate surface. Ciliate surface has appearance of abundant 3-dimensional spots or bumps. Shaft often has obvious segments. Cylinder is straight along its axis.  
Tips variable: very blunt to acuminate with a side rim present and

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22VIIBb photo4f.jpg

MUno 22VIIBb  Image

Recno 100

Family Marantaceae

Genus Calathea

Species crotalifera

Authority S. Watson

Comments  
seed bodies, background has rugulose conical bodies  
Diagnostic level: family, wild taxa

Description  
Cylindrical seed bodies, large. Shaft of cylinder with porous to densely ciliate surface. Ciliate surface has appearance of abundant 3-dimensional spots or bumps. Shaft often has obvious segments. Cylinder is straight along its axis.  
Tips variable: very blunt to acuminate with a side rim present and

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Updated 10/7/2002

22VIIBb photo5f.jpg

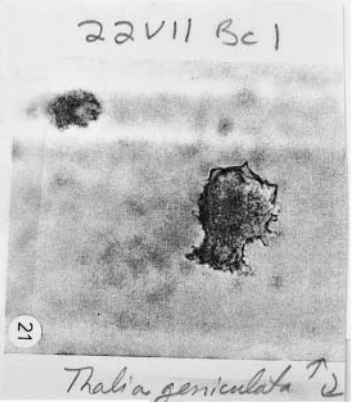
**Marantaceae** **Cylindrical seed bodies 22VIIBc1**

*Calathea* spp.  
*Thalia spp.*

Cylindrical seed bodies, large.  
Shaft of cylinder with porous to densely ciliate surface. Ciliate surface has appearance of abundant 3-dimensional spots or bumps.  
Shaft is twisted away from axis, with irregular or broken end.  
May be very shortened.  
Tip/stalk is broad with acuminate or acute stalk.

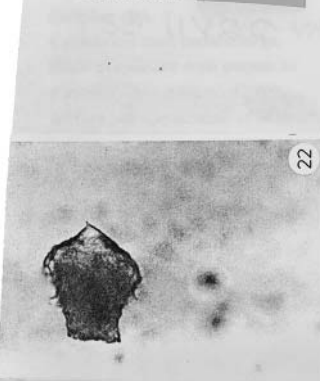
*Calathea altissima*

*Thalia geniculata*

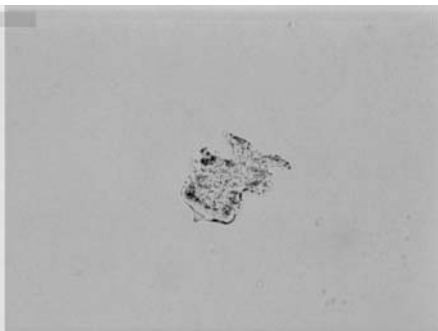


22VIIBc1 card1.jpg

**Marantaceae** **Cylindrical seed bodies 22VIIBc1**



22VIIBc1 card2.jpg

MUno 22VIIBc1  Image

Recno 95

Family Marantaceae

Genus Calathea

Species altissima

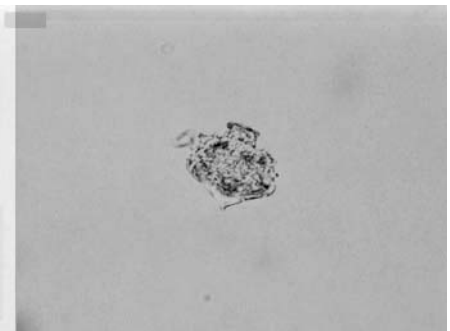
Authority (Poepp. & Endl.) Koern.

Comments  
seed body. Still has distinct, curved stalk tip of Calathea spp., but cylinder is very short relative to width.  
note "corkscrew" axis of main body shaft. This appears to be a point where the bodies "break" resulting in Tip pieces and base pieces.  
Diagnostic level: genus

Description  
Cylindrical seed bodies, large in diameter. Shaft of cylinder with porous to densely ciliate surface. Ciliate surface has appearance of abundant 3-dimensional spots or bumps. Shaft is twisted away from axis with irregular or broken end OR very shortened.  
Tip/stalk is broad with acuminate or acute stalk (often with a slight curve)

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Updated 10/7/2002

22VIIBc1 photo1f.jpg

MUno 22VIIBc1  Image

Recno 94

Family Marantaceae

Genus Calathea

Species altissima

Authority (Poepp. & Endl.) Koern.

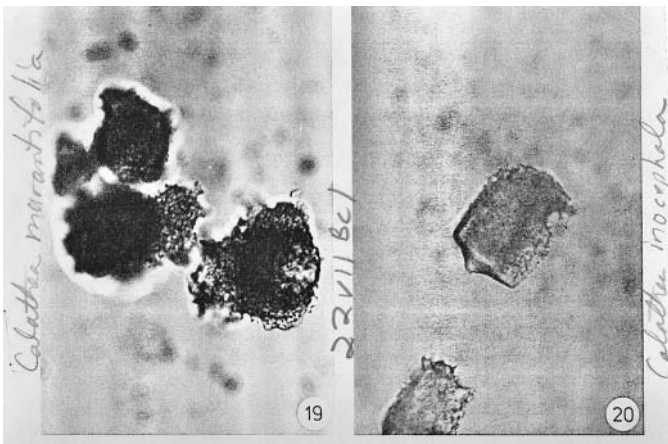
Comments  
*Calathea* spp.  
seed body. Still has distinct, curved stalk tip of Calathea spp., but cylinder is very short relative to width.  
Diagnostic level: genus

Description  
Cylindrical seed bodies, large in diameter. Shaft of cylinder with porous to densely ciliate surface. Ciliate surface has appearance of abundant 3-dimensional spots or bumps. Shaft is twisted away from axis with irregular or broken end OR very shortened.  
Tip/stalk is broad with acuminate or acute stalk (often with a slight curve)

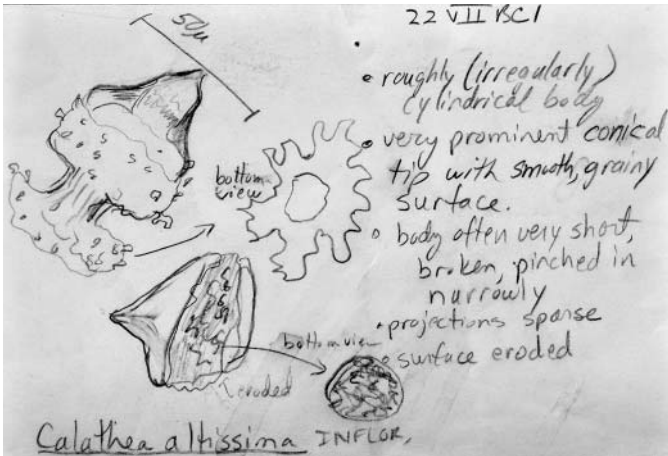
Entered by Karol Chandler-Ezell  
Updated 10/7/2002

22VIIBc1 photo2f.jpg

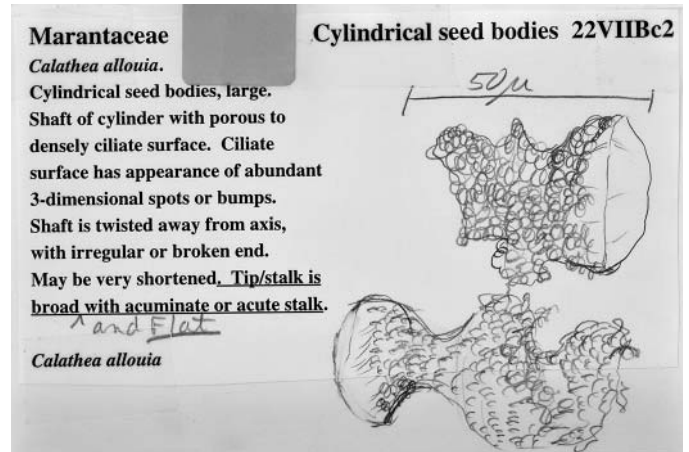




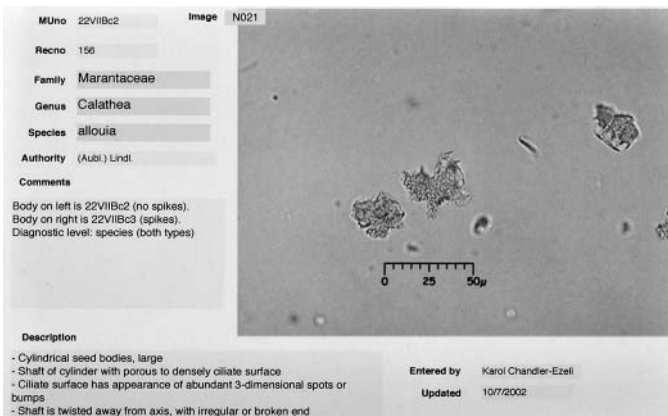
22VIIBc1 photo3f.jpg



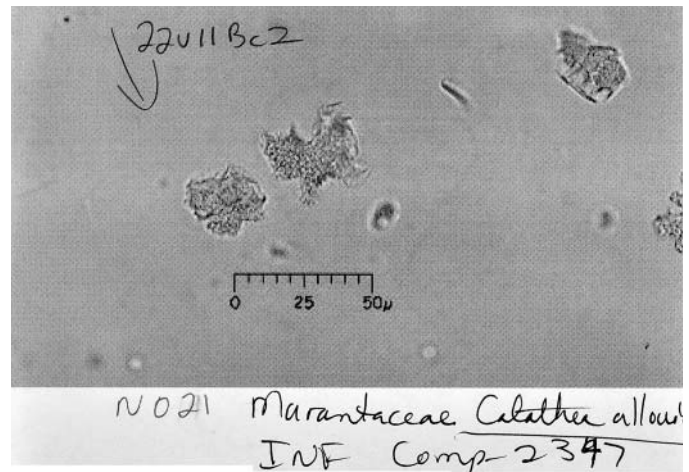
22VIIBc2 card1.jpg



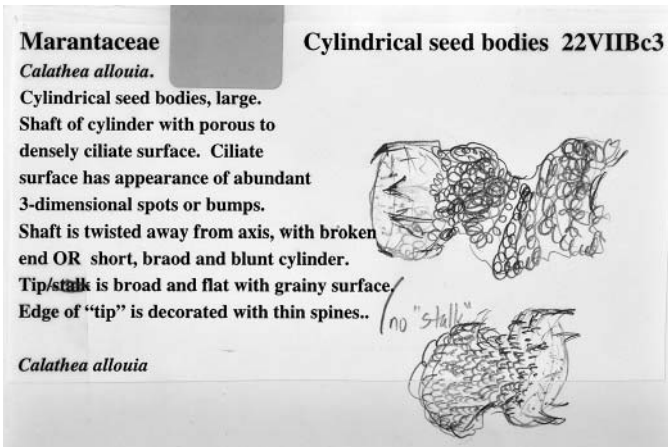
22VIIBc2 card2.jpg



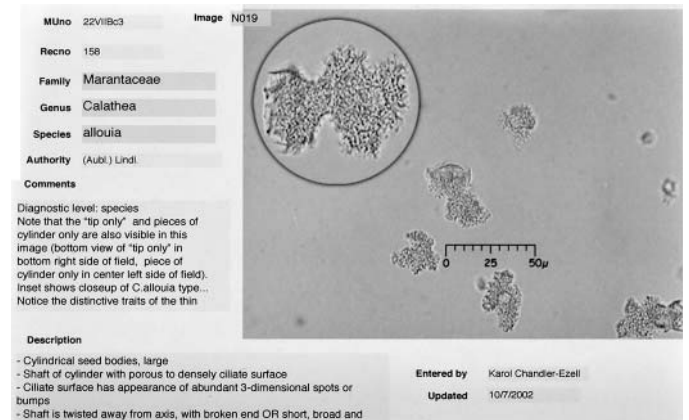
22VIIBc2 photo1f.jpg



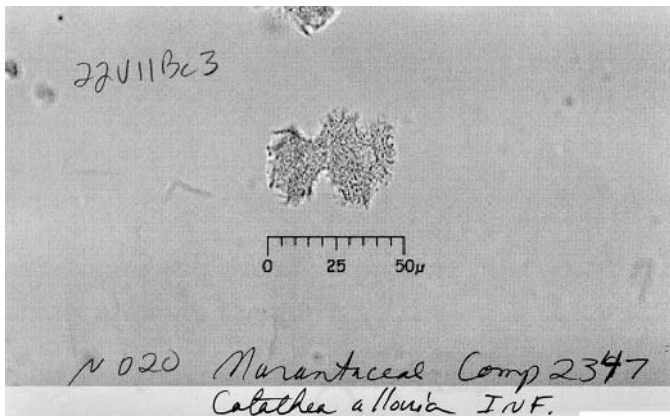
22VIIBc2 photo2f.jpg



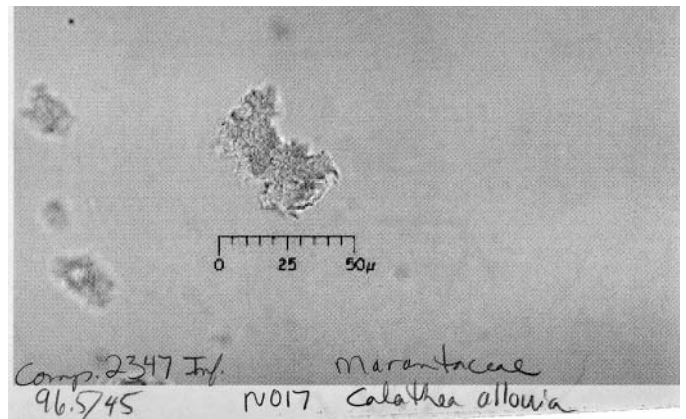
22VIIBc3 card1.jpg



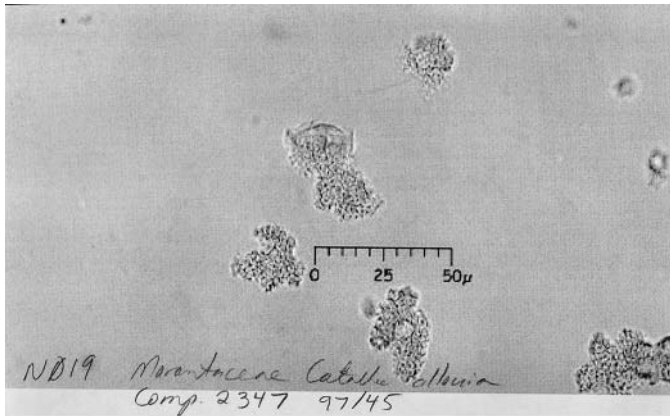
22VIIBc3 photo1f.jpg



22VII Bc3 photo2f.jpg



22VII Bc3 photo3f.jpg



22VII Bc3 photo4f.jpg

MU# 22VII Bc3 Image N020

Family Marantaceae

Genus Calathea

Species allouia

Comments

Closeup of C.allouia type  
Notice the distinctive traits of the thin spines surrounding a flattened dome tip.

Description

Cylindrical seed bodies, large.  
Shaft of cylinder with porous to densely ciliate surface.  
Ciliate surface has appearance of abundant 3-dimensional spots or bumps.  
Shaft is twisted away from axis, with broken end OR short, broad and

Entered by Karol Chandler-Ezell  
Date 5/8/2002

Contributed Information

0 25 50µ

22VII Bc3 photo5f.jpg

MUno 22VII Bc Image

Recno 92

Family Marantaceae

Genus Calathea

Species marantina

Authority (Willd. ex Koern.) K. Koch

Comments

seed body.  
Note variation in width of cylinder,  
Stalk on tip of body on left is very small, reduced.  
Stalk is missing on body on the left.  
Diagnostic level: family, not Maranta

Description

Marantaceae NOT Maranta spp.  
Pieces of cylindrical seed bodies, large diameter  
(Broken pieces of the cylinders or cylinders with missing tips )  
Segments of pieces of cylinders have porous to densely ciliate surface.  
Ciliate surface has appearance of abundant 3-dimensional spots or

Entered by Karol Chandler-Ezell  
Updated 10/7/2002

22VII Bc3 photo6f.jpg

**Marantaceae** Cylindrical seed bodies 22VII Ca

*Maranta* spp. tips

The disk of the "tip" of the cylindrical seed body. Large diameter, distinct rim. Underside shows dark, rugulose to irregular remains of cylinder. "Stalk" has smooth surface and large, smooth tip.

*Maranta* spp.  
*Maranta arundinacea*

see card 22VII Aa

22VII Ca card1.jpg

**Marantaceae** Cylindrical seed bodies 22VII Cb

*Maranta arundinacea* tips

The disk of the "tip" of the cylindrical seed body. Large diameter, distinct rim is often polyhedral or heavily outlined. Underside shows dark, rugulose to irregular and/or darkly grainy remains of cylinder. "Stalk" broad to angular to pointed

*Maranta arundinacea* see card for 22VII Aa

22VII Cb card2.jpg

**Marantaceae**  
*Calathea* spp. tips

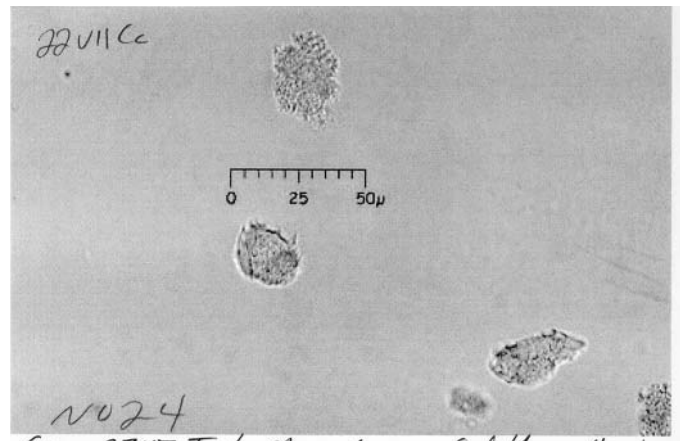
**Cylindrical seed bodies 22VII Cc**

The disk of the "tip" of the cylindrical seed body. Large diameter, distinct rim. Underside shows dark, grainy to ciliate or porous remains of cylinder. "Stalk" has grainy surface and variable tip—broad/obtuse to acuminate. May be bulbous with curving acuminate stalk.

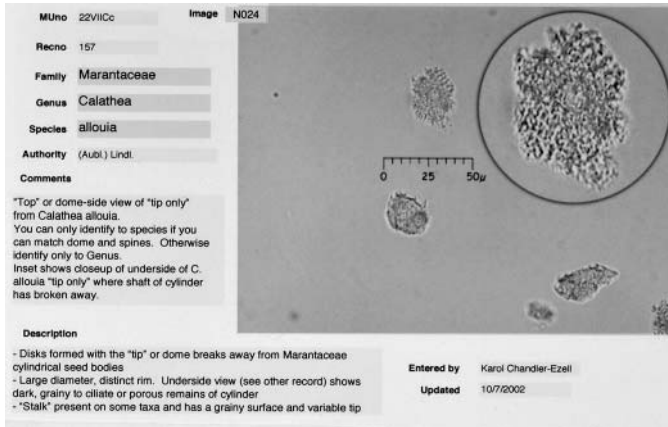


see all *Calathea* spp types

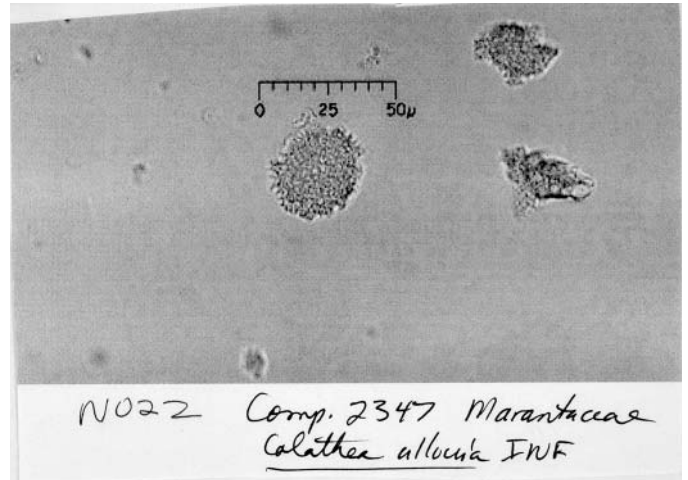
22VIICc card3.jpg



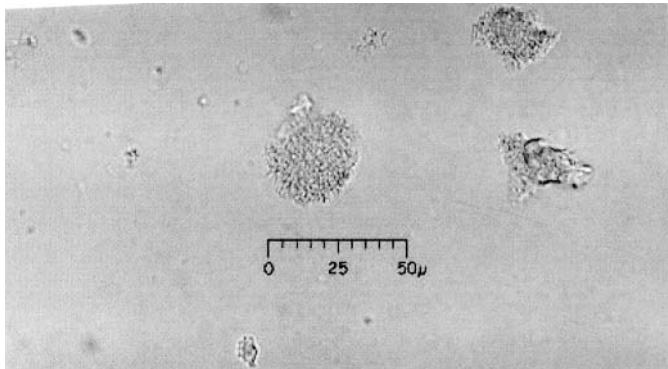
Comp 2347 Inf. Marantaceae *Calathea allouia*  
22VII Cc photo1f.jpg



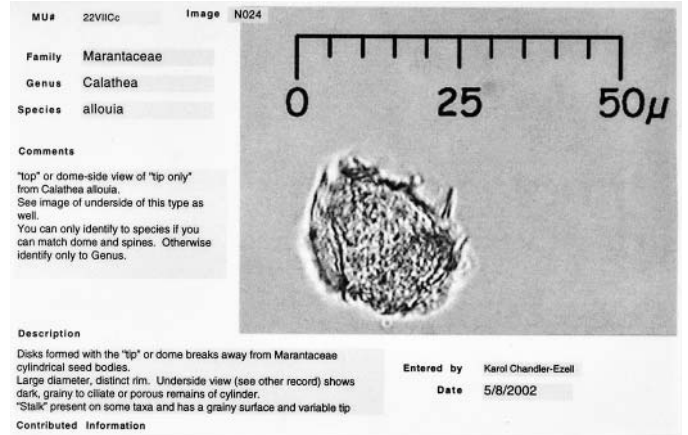
22VII Cc photo2f.jpg



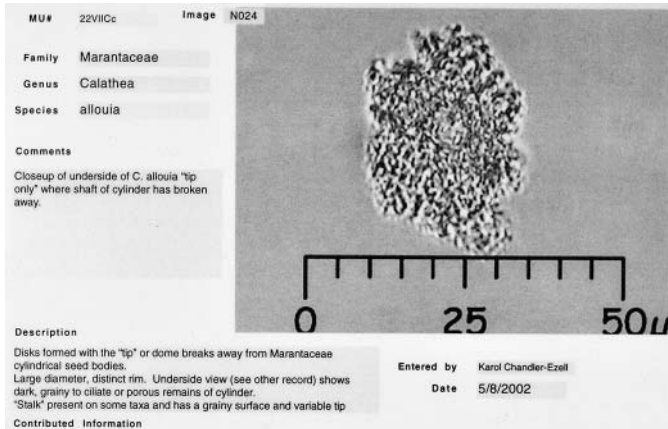
22VII Cc photo3f.jpg



22VII Cc photo4f.jpg



22VII Cc photo5f.jpg



22VII Cc photo6f.jpg

**Bodies with speculate projections**  
**Rectangular IRP > 7.5 microns wide**

- Also known as **Wide IRP** (Rectangular w/ short protrusions)
- Body rectangular in form. Long sides are roughly parallel, and may be undulating, but not crenate.
- Body may be either 2-dimensional & flattened or 3-dimensional. (i.e. thickness varies)
- Projections may be regularly or irregularly distributed, but must be along all surfaces (not just margins)
- Projections may be sparse or plentiful.
- Projections must be speculate (distinct stalk with rounded to bead-like head.) May not have acute tips.

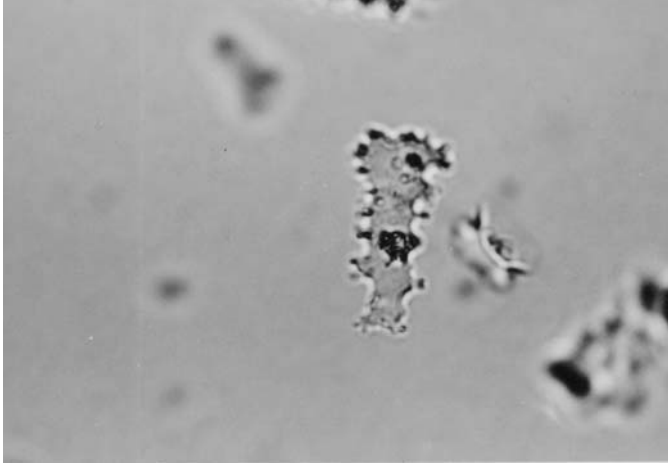
Product of epidermal silicification in inflorescence tissues.  
 Described by Piperno and Pearsall 1993)

22VIII Aa

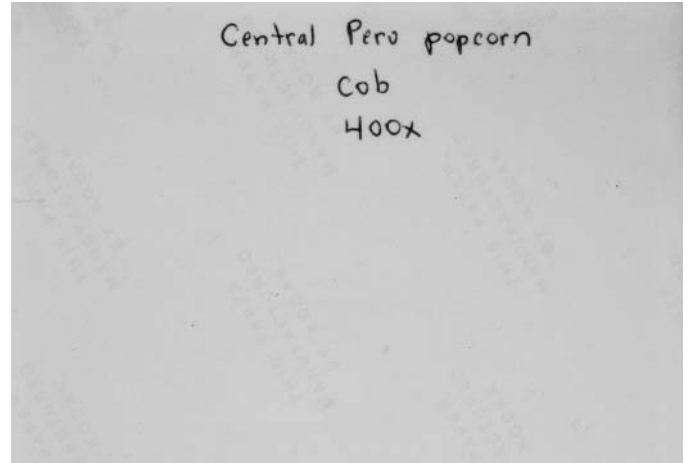
22VIII Ab: narrow, < 7.5 μm. (wild grasses).

*Zea sp + some Panicoids*

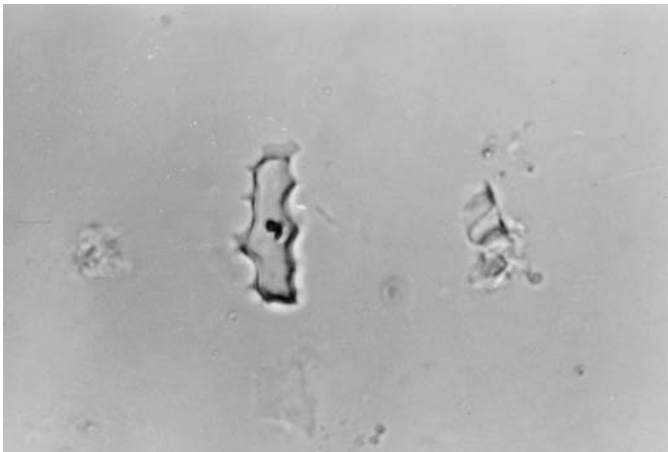
22VIII Aa card1.jpg



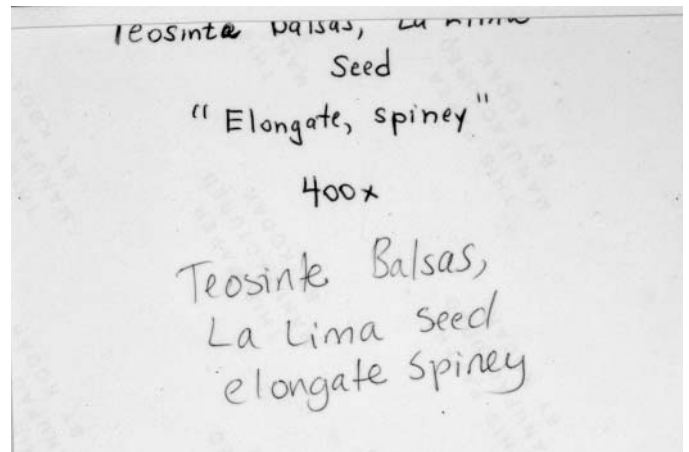
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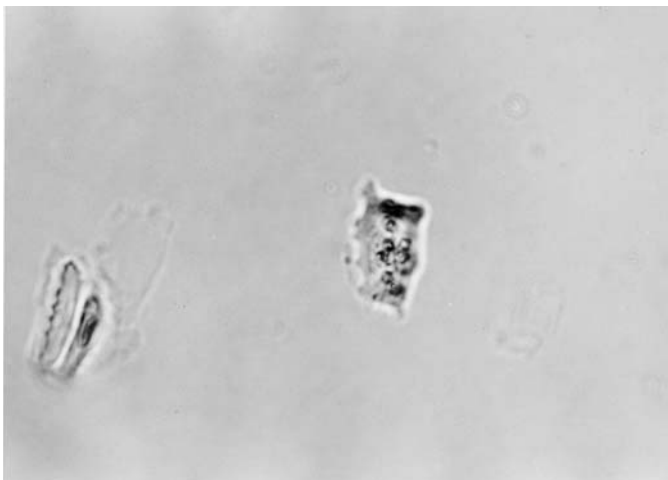
22VIII Aa photo1b.jpg



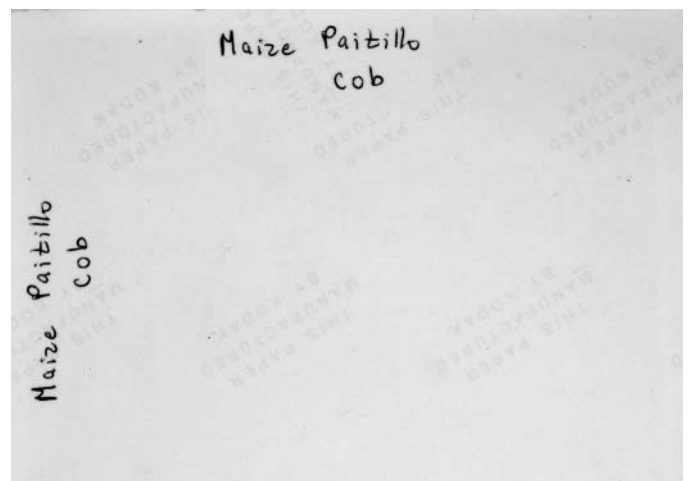
22VIII Aa photo2f.jpg



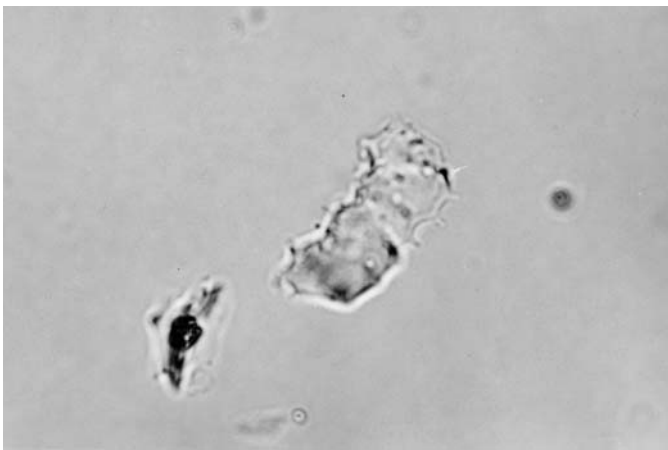
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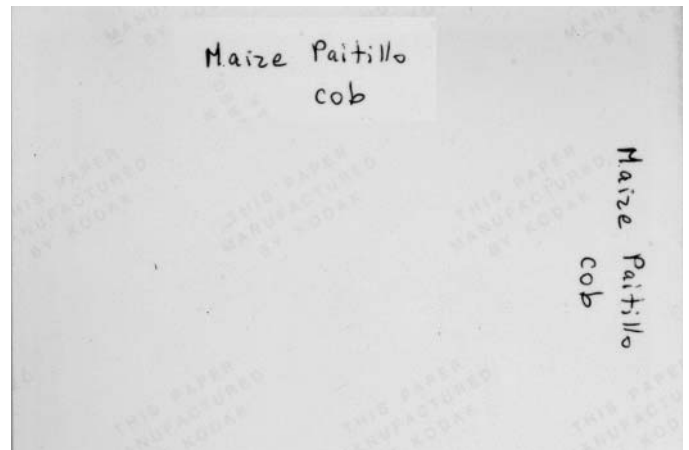
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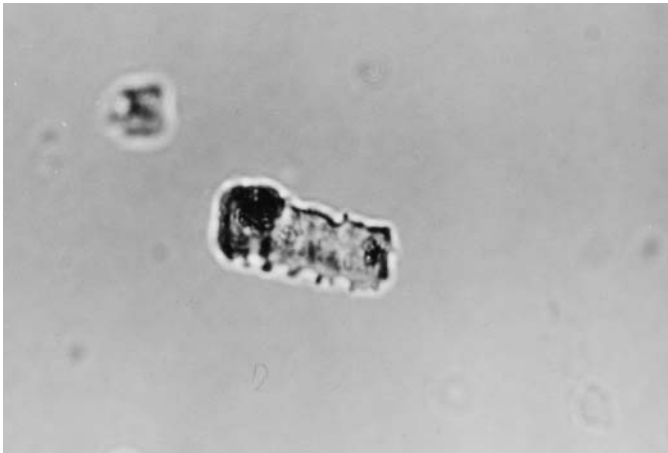
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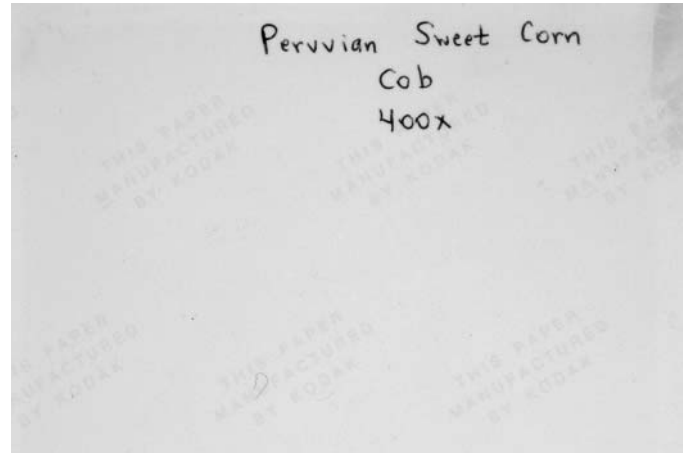
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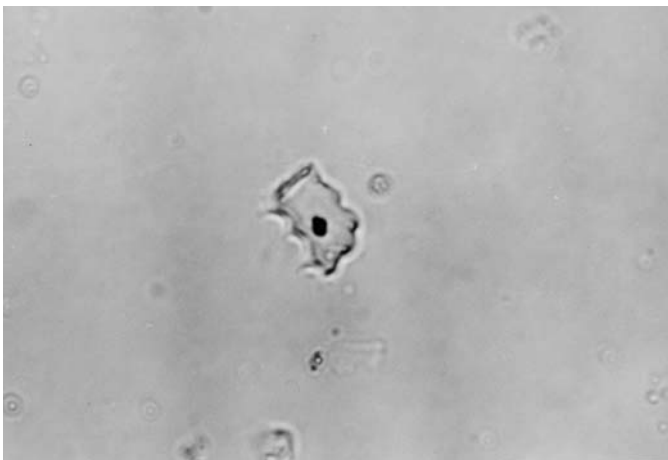
22VIIIaA photo4b.jpg



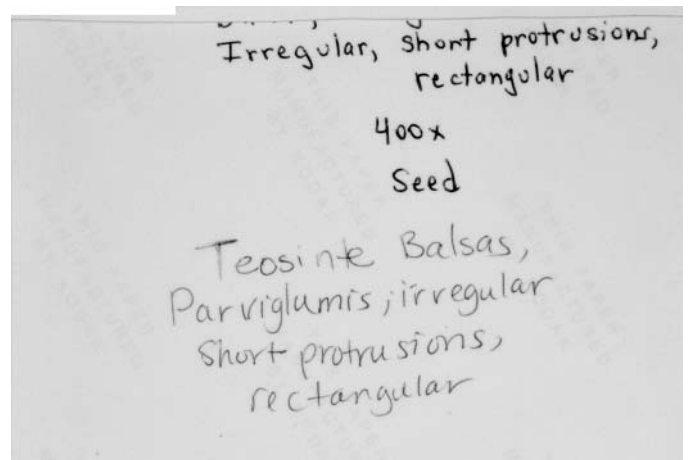
22VIIIaA photo5f.jpg



22VIIIaA photo5b.jpg



22VIIIaA photo6f.jpg



22VIIIaA photo6b.jpg

**Bodies with speculate projections**  
**Rectangular IRP < 7.5 microns wide**

22VIII Ab

- Narrow IRP (Rectangular w/ short protrusions)
- Body rectangular in form. Long sides are roughly parallel, and may be undulating, but not crenate. Width < 7.5 microns
- Body may be either 2-dimensional & flattened or 3-dimensional. (i.e. thickness varies)
- Projections may be regularly or irregularly distributed, but must be along all surfaces (not just margins)
- Projections may be sparse or plentiful. Projections must be speculate (distinct stalk with rounded to bead-like head.) May not have acute tips.

Product of epidermal silicification in inflorescence tissues. Described by Piperno and Pearsall 1993)

Panicoid grass

22VIIIAb card1.jpg

**Bodies with speculate projections**  
**Irregular IRP**

22VIII B

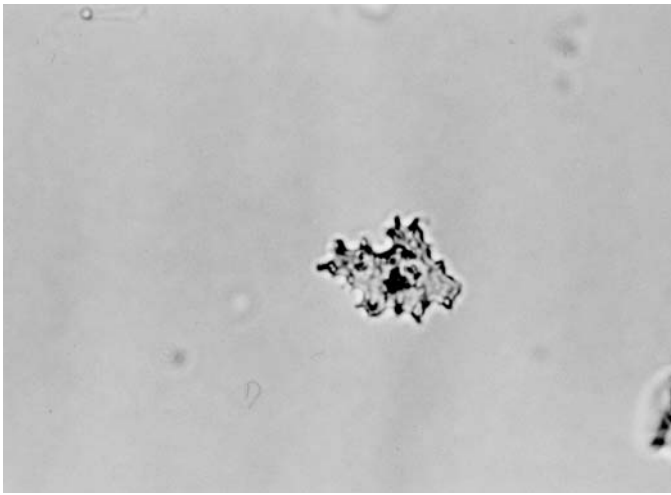
- Body irregular in form. Often L-shaped or triangular.
- Body may be either 2-dimensional & flattened or 3-dimensional. (i.e. thickness varies). Size variable.
- Silicification variable: from almost sheer to heavily silicified
- Projections may be regularly or irregularly distributed, but must be along all surfaces (not just margins)
- Projections may be sparse or plentiful. Projections must be speculate (distinct stalk with rounded to bead-like head.) May not have acute tips.

Product of epidermal silicification in inflorescence tissues. Described by Piperno and Pearsall 1993)

Zea sp  
 Lasiacis sp.  
 Opilismenus sp.

22VIIIb card1.jpg

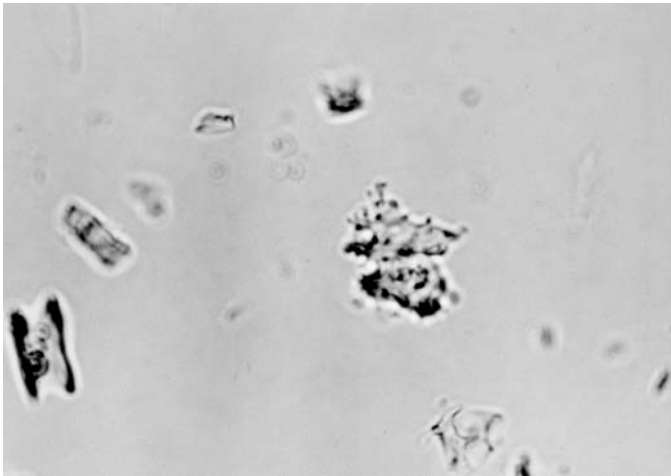




22VIIIIB photo1f.jpg



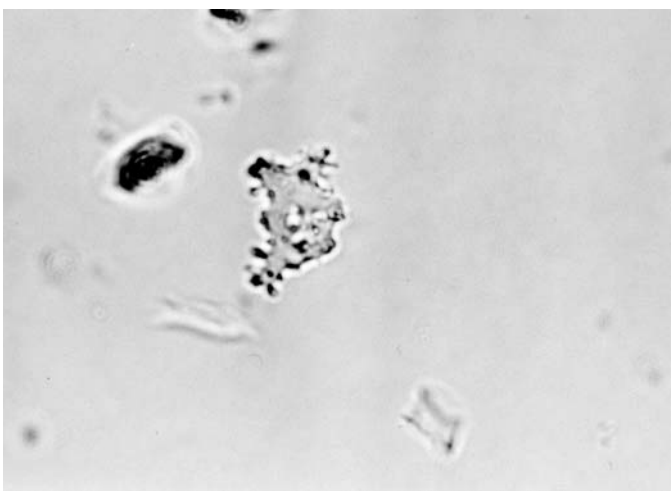
22VIIIIB photo1b.jpg



22VIIIIB photo2f.jpg



22VIIIIB photo2b.jpg



22VIIIIB photo3f.jpg



22VIIIIB photo3b.jpg

**Bodies w/ speculate projections**  
**OBLONG, half-decorated body** 22VIII C

22VIII C - 3-dimensional, base smooth, square or rectangular

- Upper part rounded, squared, or "puffed"
- Upper part 1/2 decorated with bumpy, beadlike, or speculate projections.

2418 *Zea perennis*  
 2420 *Zea sp.* 2421, 2420  
 2448 *Zea mays* spp. *parviglumis*

*Zea sp*

22VIII C card1.jpg

**Bodies with speculate projections**  
**Gracile spherical body** 22VIII Da

Gracile spherical bodies are lightly silicified.

- Has short, narrow, speculate projections.
- Projections must be speculate (distinct stalk with rounded to bead-like head) but typically sparse. May not have acute tips.
- Size typically 10-15 microns, rarely larger than 20 microns.

Rare type, occurs only in some varieties of maize.

"spud-like"

MAIZE

22VIII Da card1.jpg

**Bodies with speculate projections**  
**Robust Globular body** 22VIII Db

Body a full, three-dimensional globule with a visible smooth surface. Body very robust—heavily silicified (often appears purple under transmitted light).

- Projections may be regularly or irregularly distributed, and may be very sparse, but robust.
- Projections must be speculate (distinct stalk with rounded to bead-like head.) Often long and wide.
- Size variable but most 20-50 microns

Occur only in *Zea sp.* (teosintes and maize)

*Zea sp*

22VIII Db card1.jpg

MUno 22VIII Db Image N200

Recno 126

Family Poaceae

Genus Zea

Species luxuriens

Authority (Dunau & Asch) R.M. Bird

Comments

Sheet of robust globular bodies. Robust globular bodies occur in maize and teosinte only, and are good Zea spp. indicators. Diagnostic level: genus

Description

This type is a full, three-dimensional globule with a visible globular surface (see bottom right body inset). Projections must be speculate to fit the type. There may be very few projections on some bodies. Key diagnostic feature of this type is that the bodies are heavily silicified - appearing purple under transmitted light - and the projections are long

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 Updated 10/7/2002

22VIII Db photo1.jpg

**Bodies with speculate projections**  
**Tubular body** 22VIII E

Similar to narrow IRP, but form is a spindle, or rounded tube, with distinct, rounded or pointed tips at each end.

- Projections may be regularly or irregularly distributed, and may be ranked at 90 degree intervals about central spine.
- Projections must be speculate (distinct stalk with rounded to bead-like head.) May not have acute tips.
- Central spine not twig-like or bent in zig-zag pattern.

Product of epidermal silicification in inflorescence tissues. Rare in *Zea* spp. Occur mostly in wild grasses.

Panicoid wild grass

rounded or pointed tips

22VIII E card1.jpg

**Sphere, burr-like & Elongate bodies with Needle projections** 22IX

- Spheroid bodies or elongate, cylindrical bodies.
- Overall appearance of cockleburr.
- Projections are key trait: sharp, often curved and rise barb-like from central body, flattened and blade-like.
- Central spine of elongated bodies often bends in distinct zig-zag pattern.

Common to *Digitaria* and *Arundinella hispida*.

wild grass

22IX card1.jpg

**Blocky, 3-dimensional bodies with semi-circular cuts** 22XA

- Bodies are rectangular in shape and 3-dimensional
- Margins are irregular with 1-3 semi-circular cuts.
- Cuts frequently taken from a "corner" of the body.
- Surface undulating to roughened, may show raised ribs that thicken the body.

Teosinte indicator

Teosinte (*Zea sp.*)

22XA card1.jpg

Balsas teosinte 22XB

P1998: Balsas teosinte frintcase type (*Zea mays* spp. *parviglumis* var. *parviglumis*) (Fig 71)

Diagnostic

22XB photo1.jpg