PLANT DIVERSITY ASSESSMENT

Sumber Data Taksonomi Tumbuhan

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UNIVERSITAS INDONESIA
Veritas, Probitas, Iustitia
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

KEANEKARAGAMAN TUMBUHAN
PTA 2020/2021
KBI BOTANI

MegaAtria_KeanekaragamanTumbuhan2017_BiologiUI
Modified by Saifudin_KeanekaragamanTumbuhan2020_BiologiUI

Outline

Sources of taxonomic data

Types of data

Handling of data

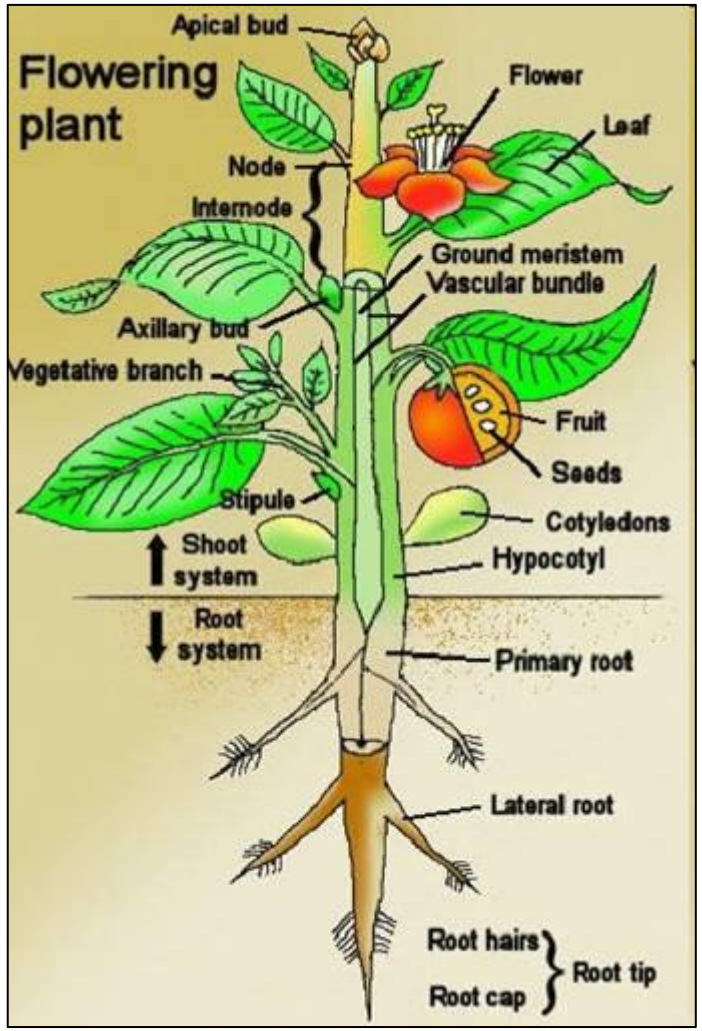
Introduction

Karakter Tumbuhan

- Pengumpulan data/informasi
- Klasifikasi

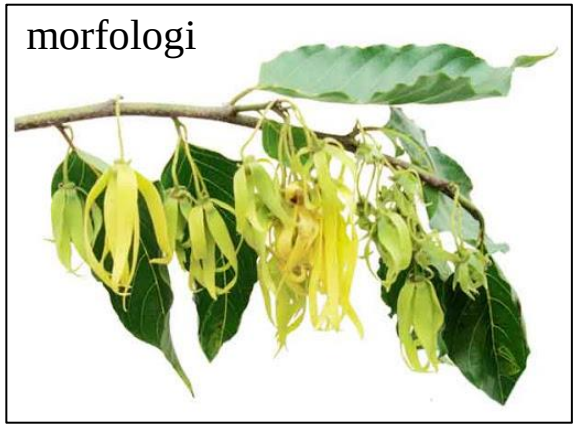
- Assesment
- Plant diversity

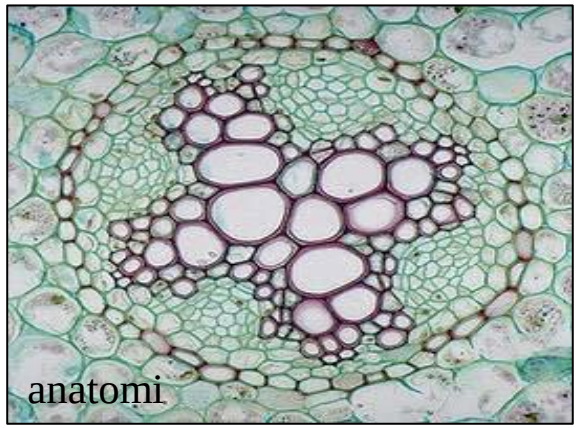
Where are the data sources?



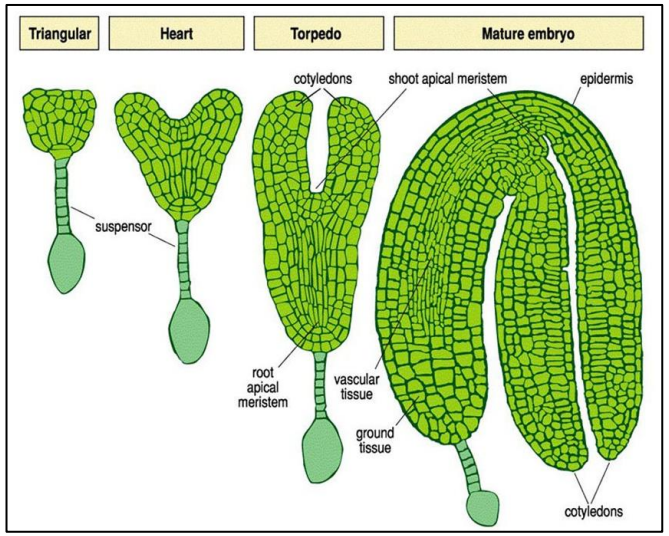
http://intranet.tdmu.edu.ua

- All parts of plant





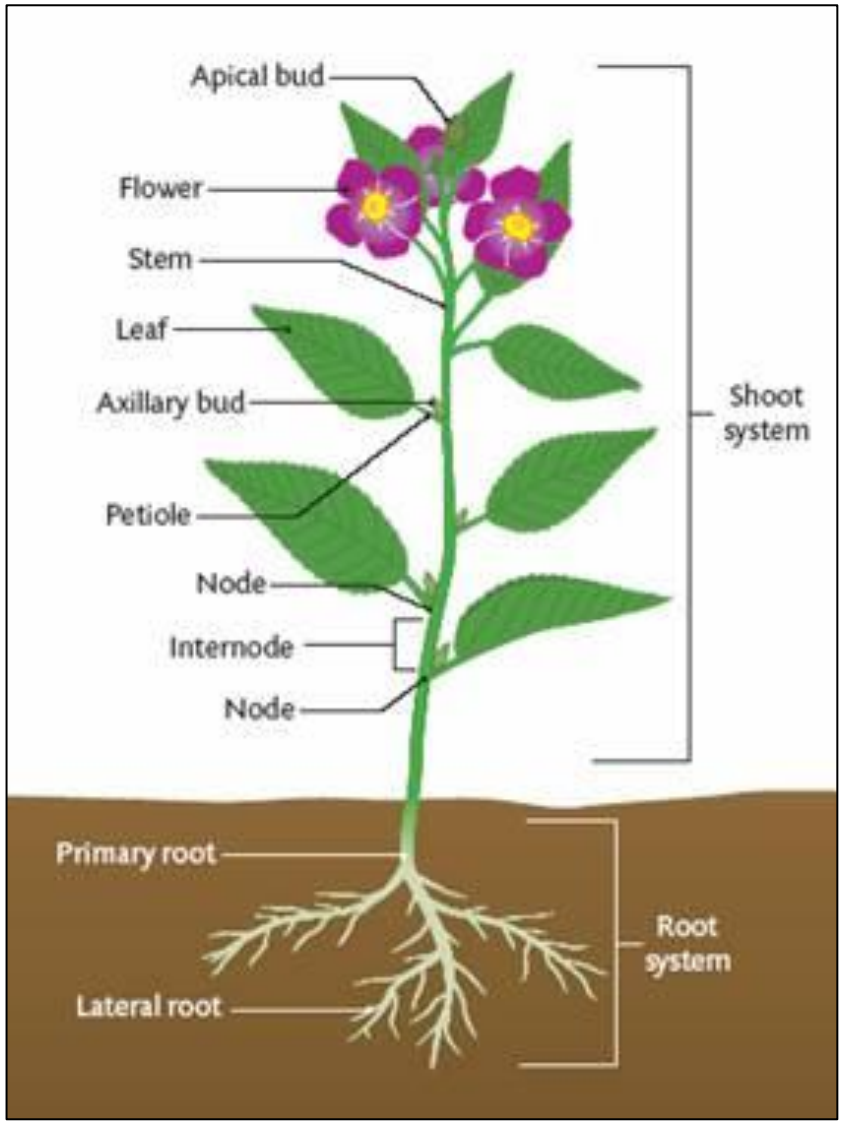
- All stages of development



Types of Data:
Major sources and useful in taxonomic studies

- Those that reflect the structural composition or architectural of plant
  → morphology, anatomy, chemistry.
- Those that refer to the dynamic interactions among the structures
  → the process of development, physiology and reproduction (pollination, dispersal, etc.)
- Comes from the organisms-environment interaction
  → distribution and ecology (distribution, variation, adaptation)

Morphological Data



- Type of data used most in plant classification
- Easily seen
- Vegetative - Generative parts
- Types of morphological data:
  - Macromorphology
  - Micromorphology

Morphological Data: Macromorphology

Vegetative features

habitus

Batang dan ranting

daun

- Macromorphology features: those features seen with the unaided eyes, or without hand lens, or binocular microscope.
- Most use in the keys because of ease and speed of observation and documentation.

Generative features

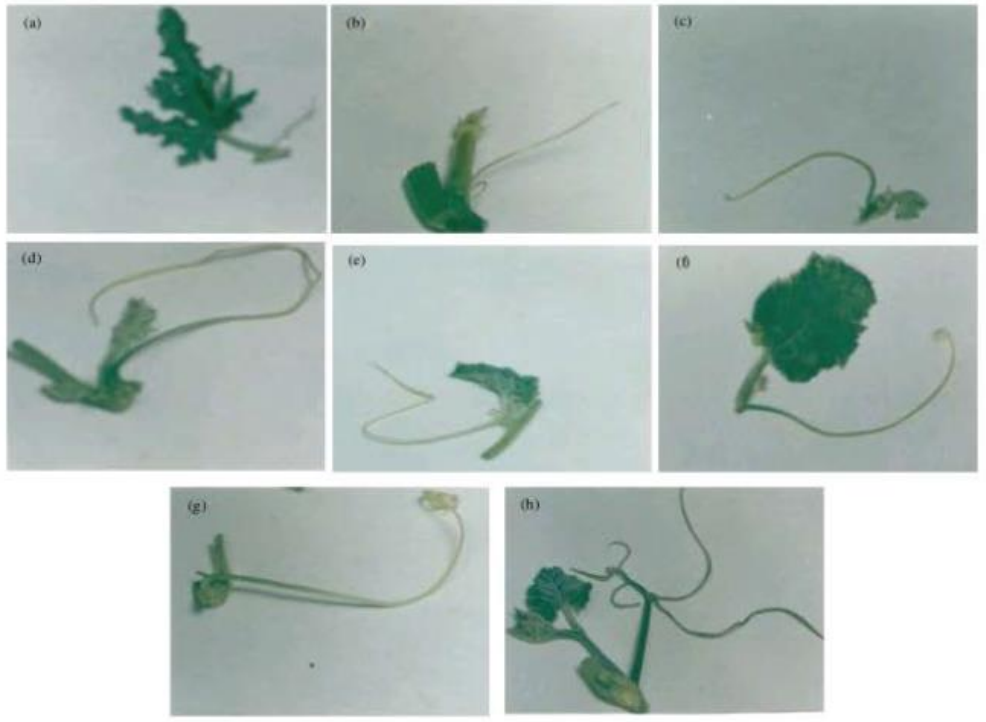
Penggunaan Data Macromorfologi

- *Cucurbitaceae* ditentukan berdasarkan sulurnya
- *Melastomataceae* ditentukan berdasarkan bentuk morfologi daunnya.

Leaf morphology of the *Bredia* clade: A.*B. changii; B. B. guidongensis; C. B. hirsute; D. B. longiradiosa var. pulchella; E. B. microphylla; E. B. plagiopetala; F. B. tuberculate; G. B. yunnanensis.*

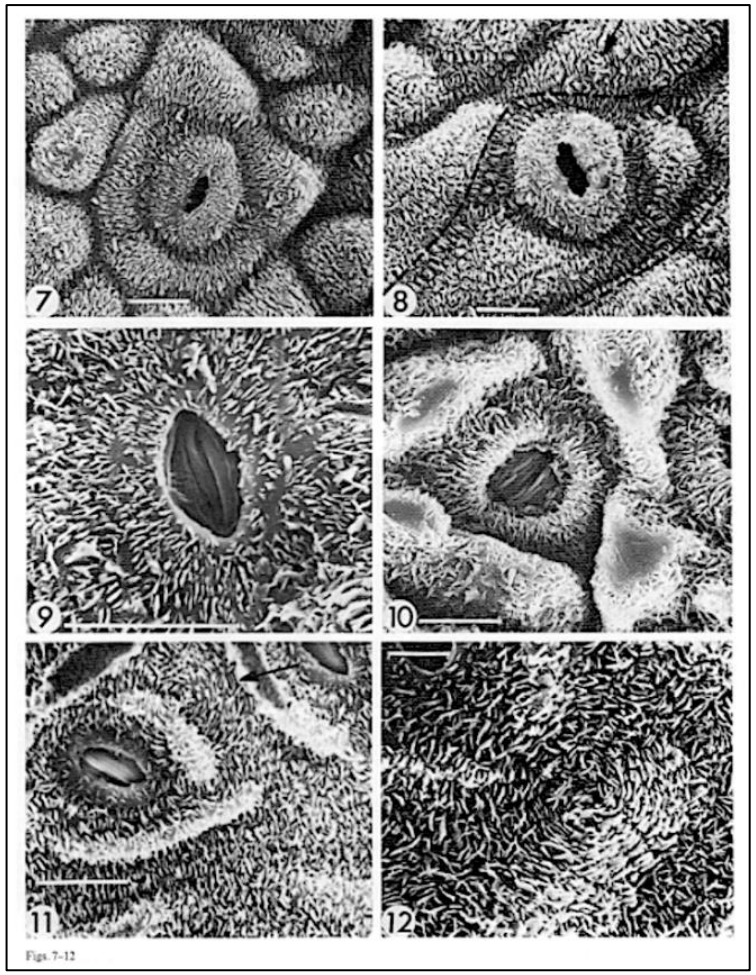
Source: Zhou, dkk. (2019)

Source: Al-Maghrabi dkk. (209)

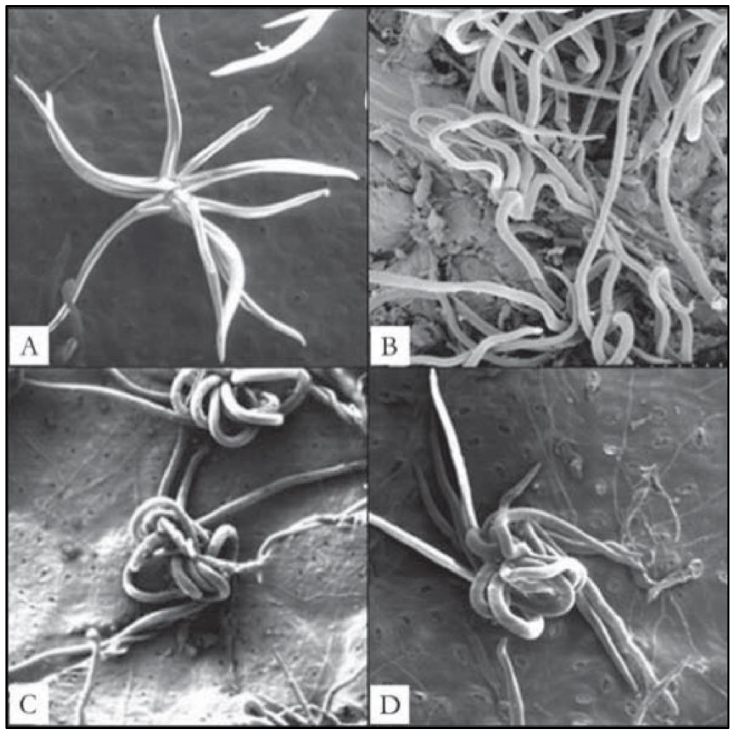


Photographs showing the morphological characters of eight different cucurbit genera tendrils. (a) *Citrullus colocynthis*, (b) *Citrullus vulgaris* var. Giza 3, (c) *Cucumis dudaim* Ananas harest Fl, (d) *Cucumis dudaim* var. Cantaloupe angar choice, (e) *Cucumis dudaim* var. Melon jaune cahaaria (French), (f) *Cucumis dudaim* var. Ismailawy, (g) *Cucumis melo* var. Flexuosus and (h) *Cucurbita maxima*

Morphological Data: Micromorphology



Epicuticular waxes among species of *Eucalyptus* (Myrtaceae)



Fasciculate sessile trichome on the abaxial leaf surface of *Quercus* spp.

- Micromorphological features: seen only with compound light microscopes (shallow depth observation) or with Scanning Electron Microscope (SEM).

Anatomical Data

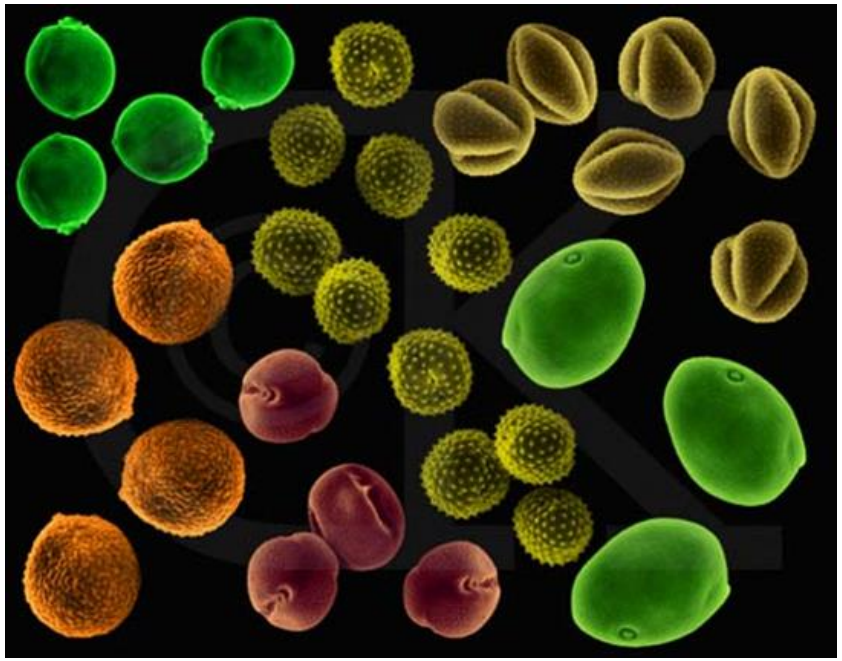
- After morphological observation, anatomy approach of leaves, stem and root could potentially yield different information.
- Floral and fruits anatomy *usually correlate* well with observed reproductive morphological features.
- 2 types: endomorphic and ultrastructural
- Endomorphic: light microscope
- Ultrastructural: transmission electron microscope (TEM), scanning electron microscope (SEM)
- Sources of anatomical data: leaf anatomy, stem anatomy, root anatomy, nodal anatomy, wood anatomy, etc.

light microscope

SEM

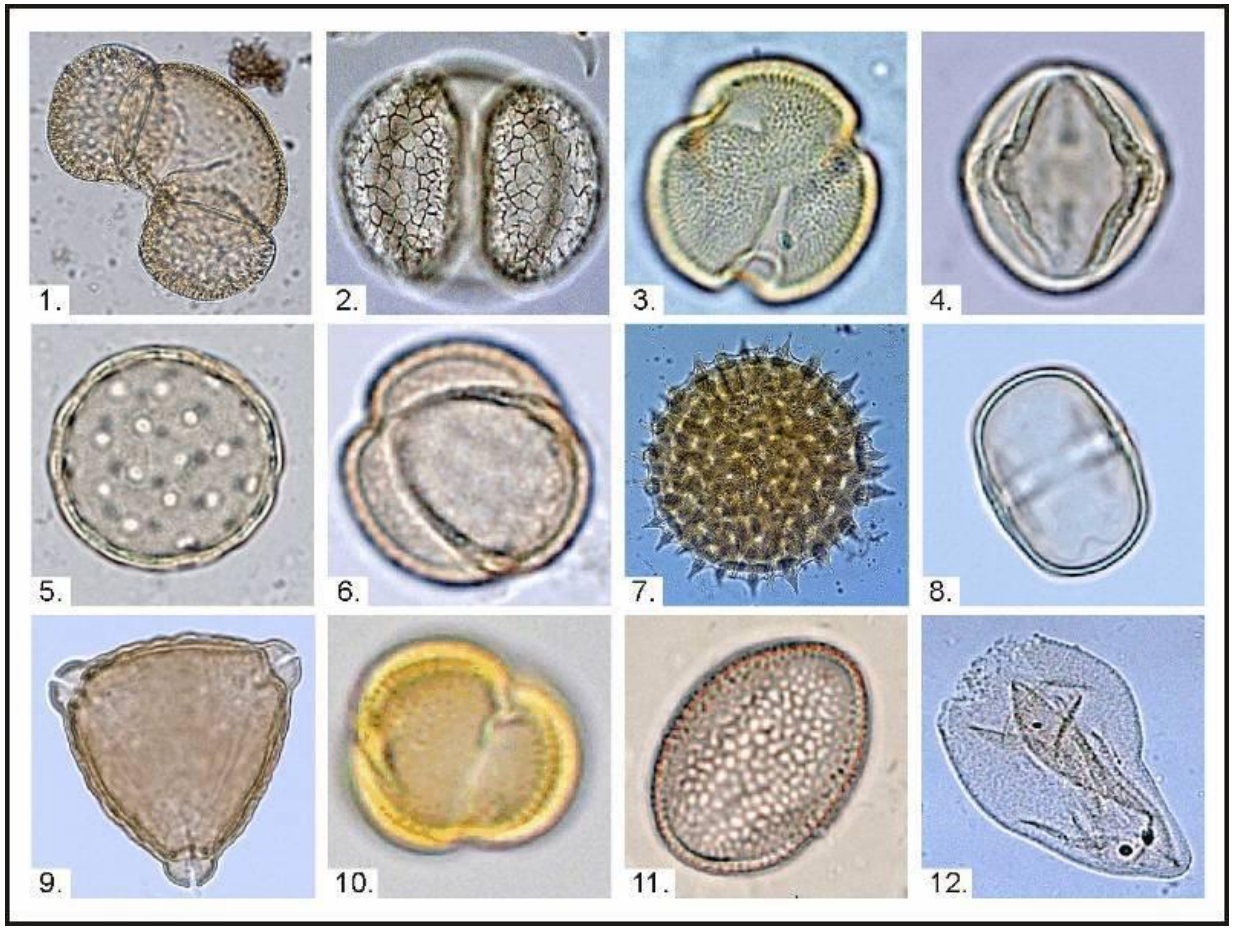
Data PALYNOLOGY

- The study of pollen and grains (part of embryology), intergrades with reproductive biology and pollination biology -- pollen-stigma interaction
- Data from pollen grains are useful at all levels at the taxonomic hierarchy. Good effect for generic and sub generic level.



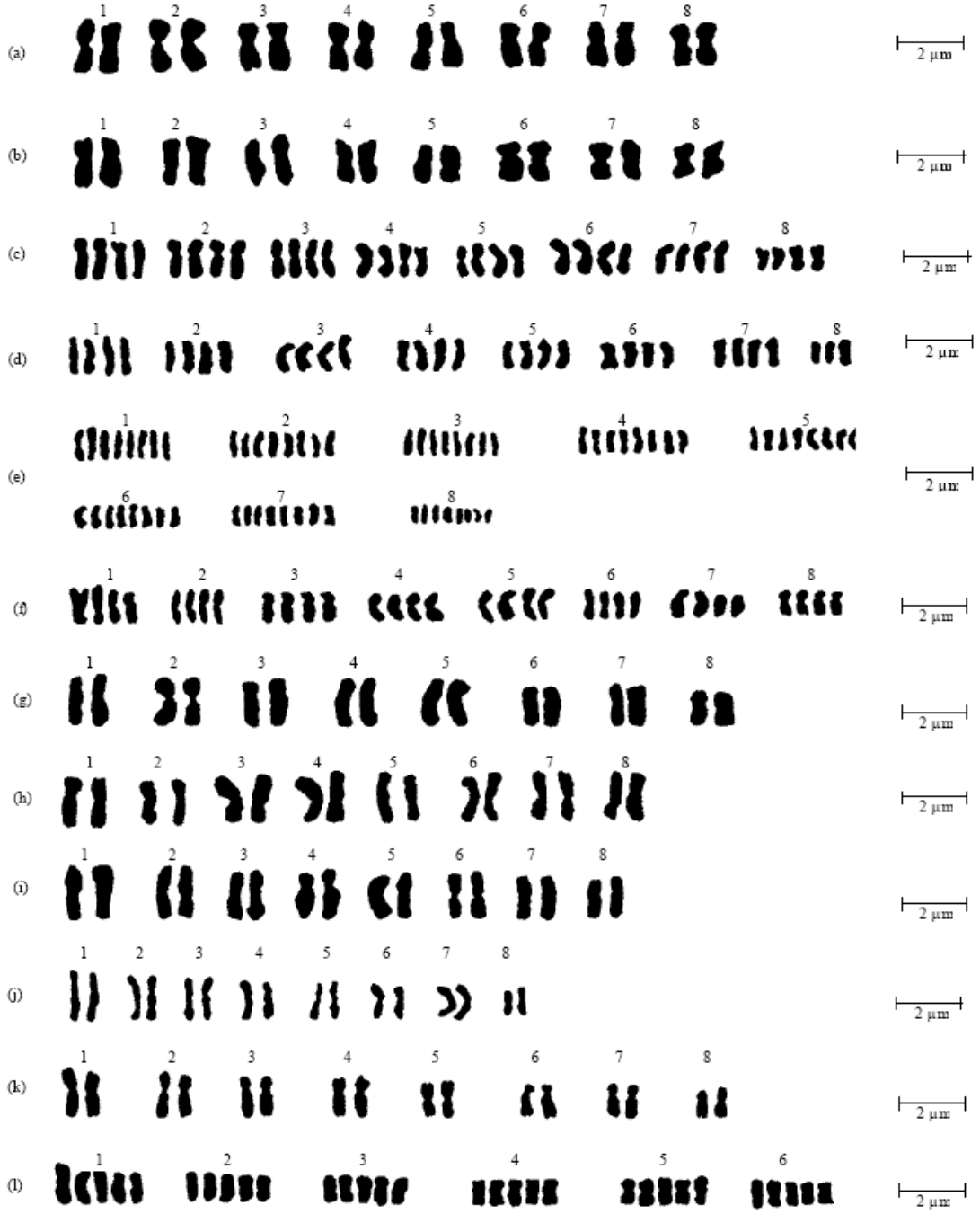
Types of palynological data

- Aggregation and shape of grains
- Aperture number: colpus (furrow) and porus
- Shape and position
- External wall layer (primarily the exine structures/stratification)
- Internal protoplasm
- Sculpture



Data SITOLOGI

- The study of the cell, but only information about chromosomes is used for classification purposes (Stebbins, 1871)
- Types of cytological data : number, size and shape, behavior in meiosis, DNA content
- Chromosome number: variation came from gain or loss of regular chromosomes
- **Aneuploidy** (Aneuploidy is the presence of an abnormal number of chromosomes in a cell). **Euploidy** (duplication of complete sets -- **homoploidy**, **polyploidy**)



Abdelfattah Badr and Sherif M. Sharawy (2007)

KARYOTYPE

A karyotype is the number and appearance of chromosomes in the nucleus of an eukaryotic cell.

Karyotypes of 12 taxa of Egyptian Astragalus L. a: A. hispidulus, b: A. hispidulus spp. Kralikianus, c: A. hamosus, d: A. hamosus var. brachyceras, e: A. hamosus var. brachyceras, f: A. hamosus var. buceras, g: A . carpinus, h: A. fruticosus, i: A. sieberi, j: A. trigonus, k: A. dactylocarpous spp. acinaciferus and l: A. boeticus

Metode Identifikasi Tumbuhan

Identifikasi tumbuhan dapat dilakukan dalam 4 metode:

1. kunci taksonomi
2. membandingkan spesimen
3. menulis deskripsi tumbuhan
4. pendapat lembaga atau ahli.

14.	a.	Daun tersebar, kadang-kadang sebagian berhadapan.[3] **15**
	b.	Semua daun duduk berhadapan.[4] **16**
15.	a.	Daun tunggal, tetapi tidak berbagi menyirip rangkap sampai bercangap menyirip rangkap (golongan 8). **109**
	b.	Daun mejemuk menjari atau majemuk menyirip atau juga tunggal, kalau demikian tentu berbagi menyirip rangkap sampai bercangap menyirip rangkap (golongan 9). **197**

Karakter	Deskripsi karakter
Karakter Vegetatif	
a. Habitus	tree
b. Daun	**Tata daun**: alternate (berseling, hanya satu helai daun melekat di setiap buku), daun tertata mengitari ranting seperti spiral (arranged spirally) **Bentuk daun**: blade orbicular, deltoid, ovate or oblong, simple and entire; pointed with entire margins, shiny dark green on upper surface, paler beneath, slightly thickened and leathery, becoming nearly hairless. **Pangkal-Ujung daun**: base cordate, apex acuminate.
c. Batang	The trunk is often twisted or bent, becoming hollow with age, with grey or light-brown bark, smooth or slightly fissured, becoming thick and rough, and inner bark pink to yellowish, tough and fibrous
Karakter Generatif	
a. Perbungaan	Flowers solitary in leaf axils, bisexual
b. Perhiasan Bunga	Calyx is cup shaped, green, remaining at the base of fruit, with 3-5 narrow green scales (bracts), falling from the bud. Petals five, broad rounded oblique, pale yellow, usually with maroon spot at base, with tiny star shaped hairs on outer surface
c. Androecium	Stamens many on column, 2.5 cm long joined at petals at base.
d. Gynoecium	Pistil has five-celled ovary with slender style and five broader stigmas
e. Biji/Buah	Fruits (seed capsules) rounded but flattened, slightly five-ridged, dark grey, hard, woody and dry, with calyx at base, usually remaining attached and not splitting open. Seeds several, elliptical, brown hairy.

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Terima kasih

Video Bantuan Dana Mata Kuliah PJJ DPASDP UI 2020

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