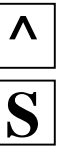


TAXONOMIC LUMBER



BROAD TAXON CONCEPT

EMPLOYS BROAD
CHARACTER STATES

RECOGNIZES FEW TAXA

TAXONOMIC LUMBER

TAXONOMIC SPLITTER

TAXONOMIC SPLITTER



NARROW TAXON CONCEPT

TAXONOMIC SPLITTER

TAXONOMIC SPLITTER



NARROW TAXON CONCEPT

EMPLOYS NARROW
CHARACTER STATES

TAXONOMIC SPLITTER

TAXONOMIC SPLITTER

NARROW TAXON CONCEPT

EMPLOYS NARROW
CHARACTER STATES

RECOGNIZES MANY TAXA

TAXONOMIC SPLITTER

**TAXONOMIC
LUMBER
VS
SPLITTER
APPLIED**

**MONOGRAPH
OUTSET
Unaopsis
TEN
RECOGNIZED
NAMES/SPECIES**

Unaopsis alpha

Unaopsis beta

Unaopsis delta

Unaopsis epsilon

Unaopsis gamma

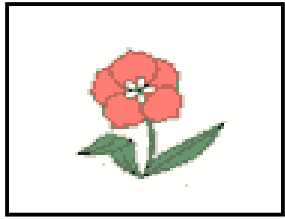
Unaopsis kappa

Unaopsis omega

Unaopsis sigma

Unaopsis theta

Unaopsis unaopsis



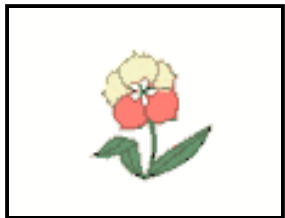
Unaopsis beta Killgore
Unaopsis omega



Unaopsis sigma Kellogg
Unaopsis gamma
Unaopsis unaopsis



Unaopsis delta Sims
Unaopsis alpha
Unaopsis kappa
Unaopsis theta



Unaopsis zeta Floyd sp. nov.



Unaopsis epsilon Ford

Unaopsis alpha

Unaopsis beta

Unaopsis delta

Unaopsis epsilon

Unaopsis gamma

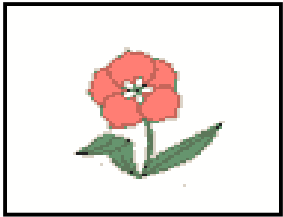
Unaopsis kappa

Unaopsis omega

Unaopsis sigma

Unaopsis theta

Unaopsis unaopsis



Unaopsis beta Killgore
Unaopsis omega

Unaopsis alpha
Unaopsis beta
Unaopsis delta



Unaopsis sigma Kellogg
Unaopsis gamma

TAXONOMIC LUMBER



Unaopsis zeta Floyd sp. nov.

Unaopsis sigma
Unaopsis theta



Unaopsis epsilon Ford

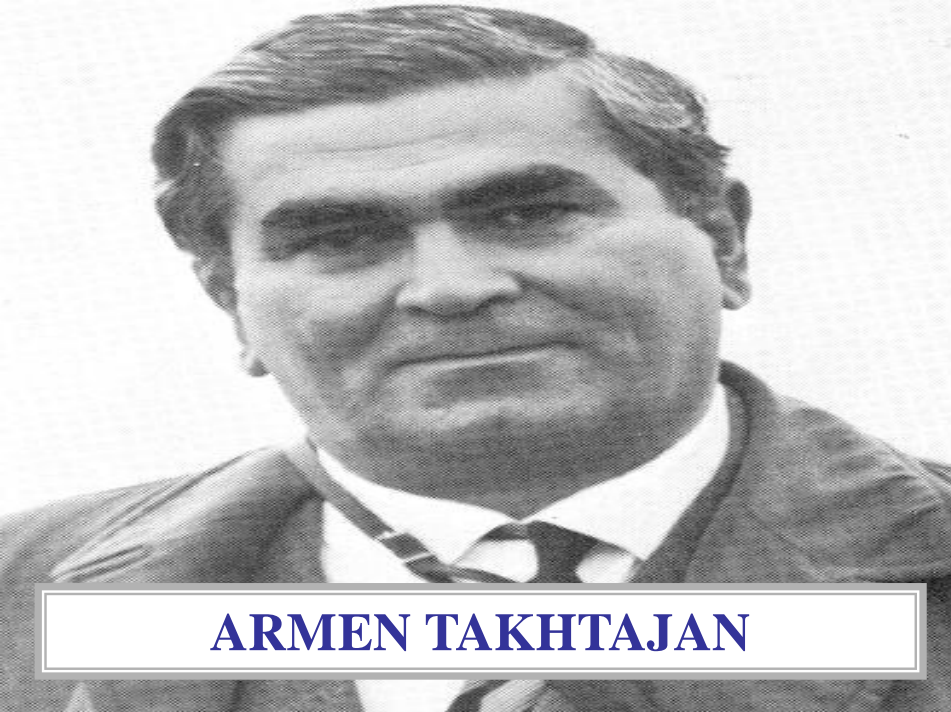
Unaopsis unaopsis



**TAXONOMIC LUMBER
VS
TAXONOMIC SPLITTERS**

**APPLIED AT ANY
TAXONOMIC LEVEL**

**TAXONOMIC LUMBER
VS
TAXONOMIC SPLITTERS**

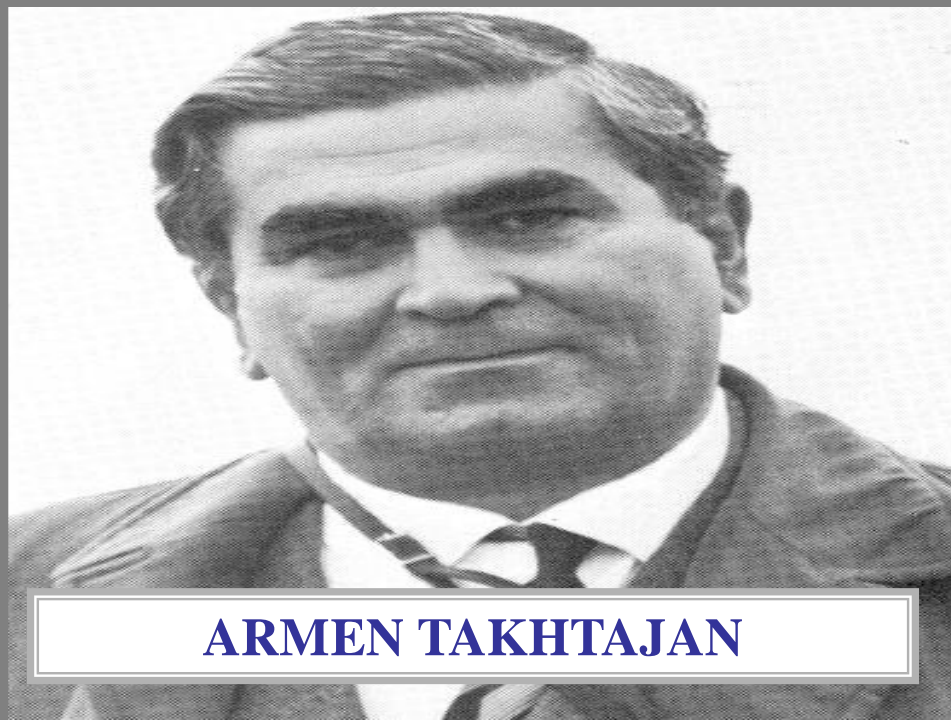


ARMEN TAKHTAJAN

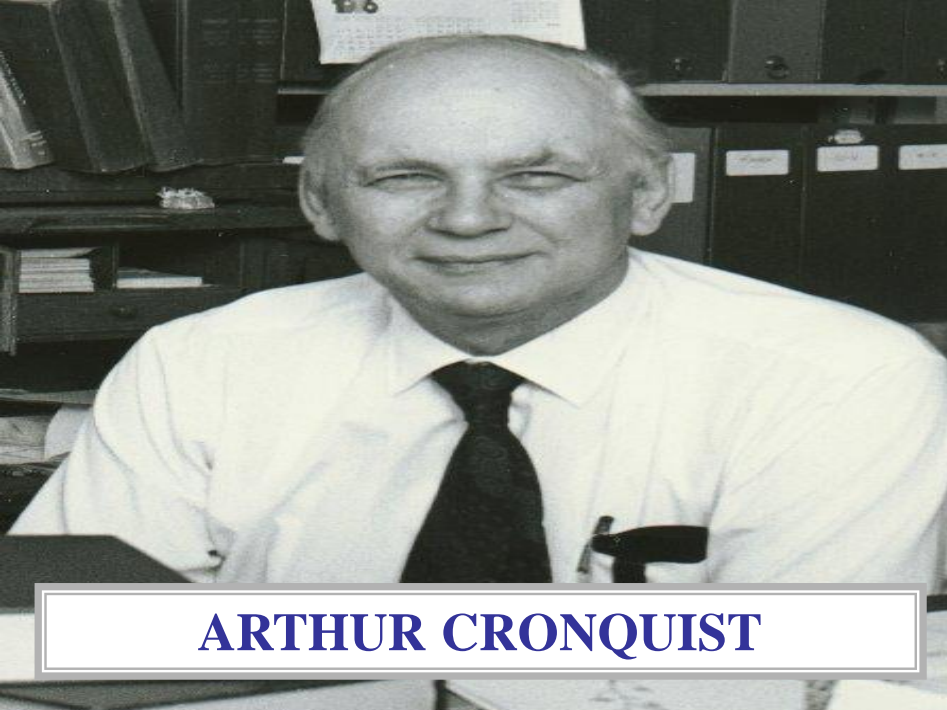
**FAMILY
SPLITTER**
532
**ANGIOSPERM
FAMILIES**



**FAMILY
SPLITTER**
532
**ANGIOSPERM
FAMILIES**



ARMEN TAKHTAJAN



ARTHUR CRONQUIST

**FAMILY
LUMBER**

387

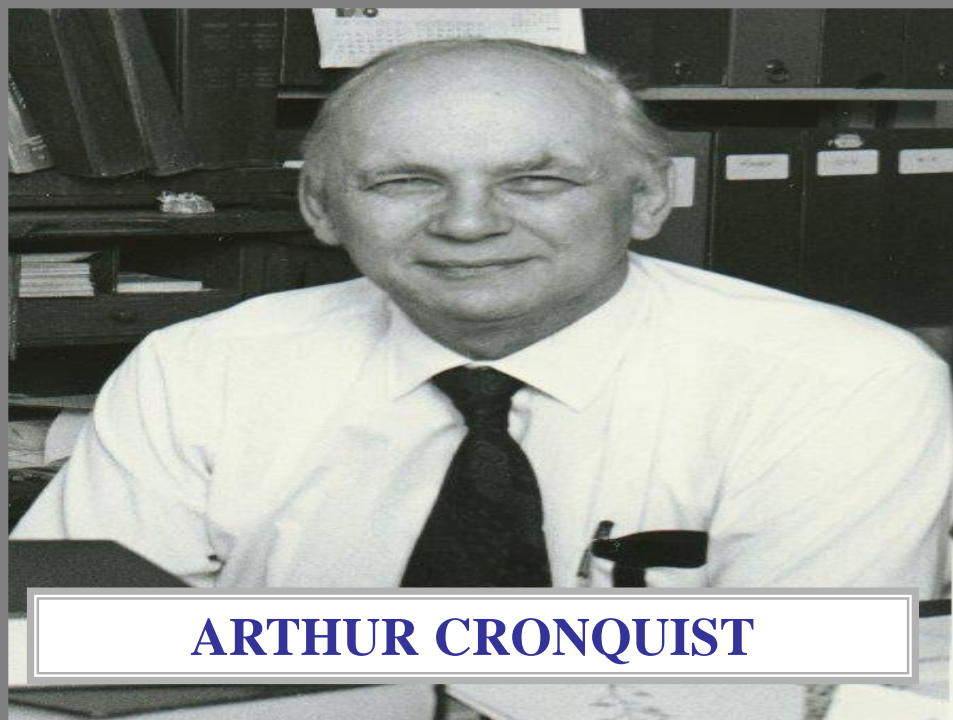
**ANGIOSPERM
FAMILIES**



**FAMILY
LUMBER**

387

**ANGIOSPERM
FAMILIES**



ARTHUR CRONQUIST



PLANT TAXONOMY COMPONENTS

SYSTEMATIC STUDIES

SYSTEMATIC STUDIES

SYSTEMATIC STUDIES



BIO-DIVERSITY CLASSIFICATION

SYSTEMATIC STUDIES

CLASSIFICATION

CLASSIFICATION



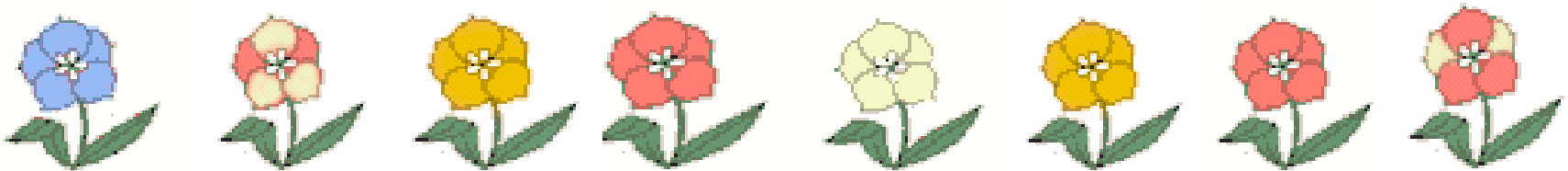
GROUPS ORGANISMS
WITH SHARED
CHARACTERS

CLASSIFICATION

CLASSIFICATION

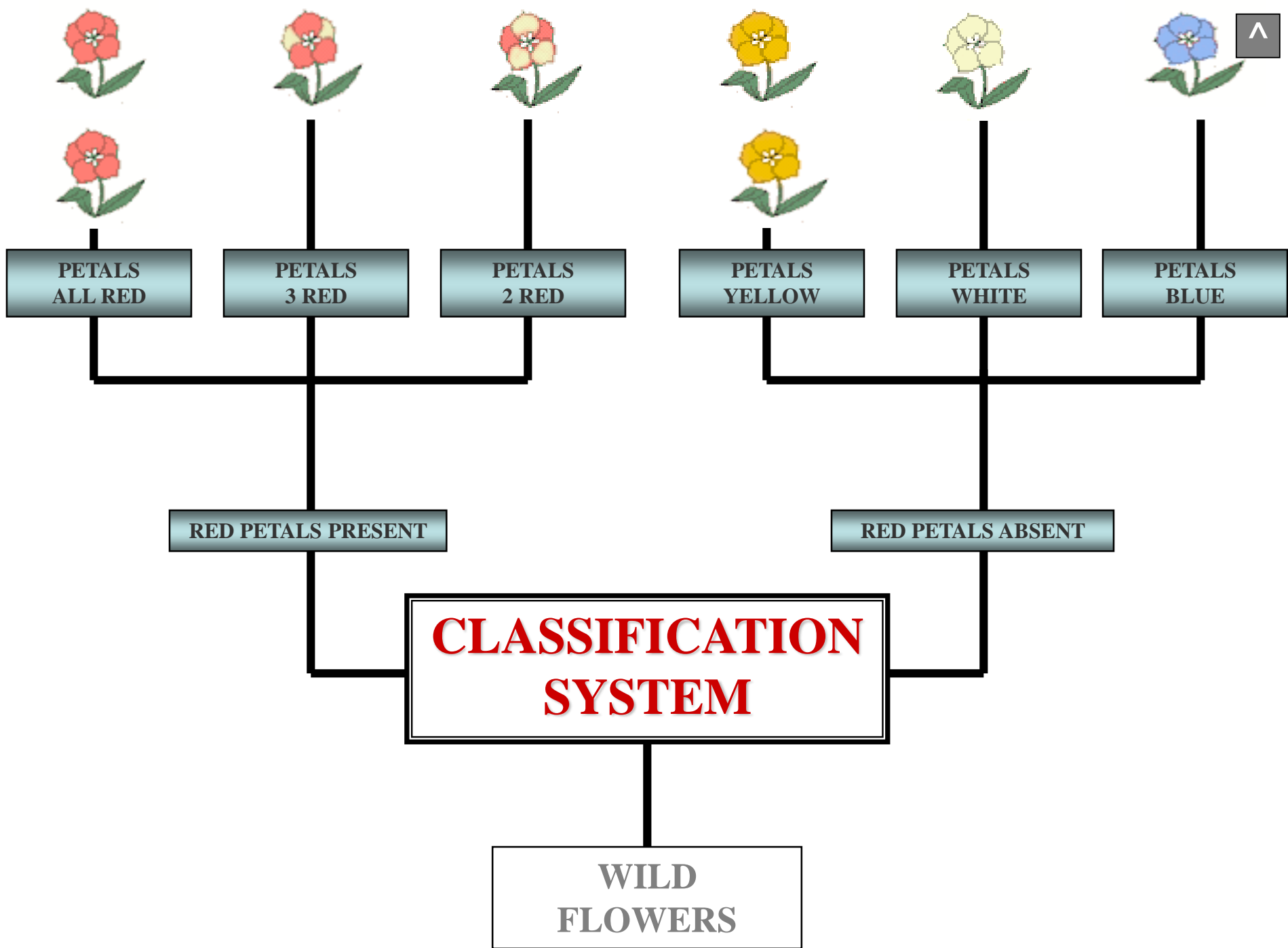


GROUPS ORGANISMS
WITH SHARED
CHARACTERS



FLOWER COLOR

WILD
FLOWERS





**ARTIFICIAL
CLASSIFICATION
VS
NATURAL
CLASSIFICATION**

ARTIFICIAL CLASSIFICATION

ARTIFICIAL CLASSIFICATION



ARTIFICIAL CLASSIFICATION

BASED ON FEW CHARACTERS

ARTIFICIAL CLASSIFICATION



ARTIFICIAL CLASSIFICATION

**BASED ON FEW CHARACTERS
LOW CHARACTER CORRELATION**

ARTIFICIAL CLASSIFICATION



ARTIFICIAL CLASSIFICATION

**BASED ON FEW CHARACTERS
LOW CHARACTER CORRELATION
GROUPS UNRELATED ORGANISMS**

ARTIFICIAL CLASSIFICATION



ARTIFICIAL CLASSIFICATION

**BASED ON FEW CHARACTERS
LOW CHARACTER CORRELATION
GROUPS UNRELATED ORGANISMS
DESIGNED FOR NON-SCIENTIST**

ARTIFICIAL CLASSIFICATION

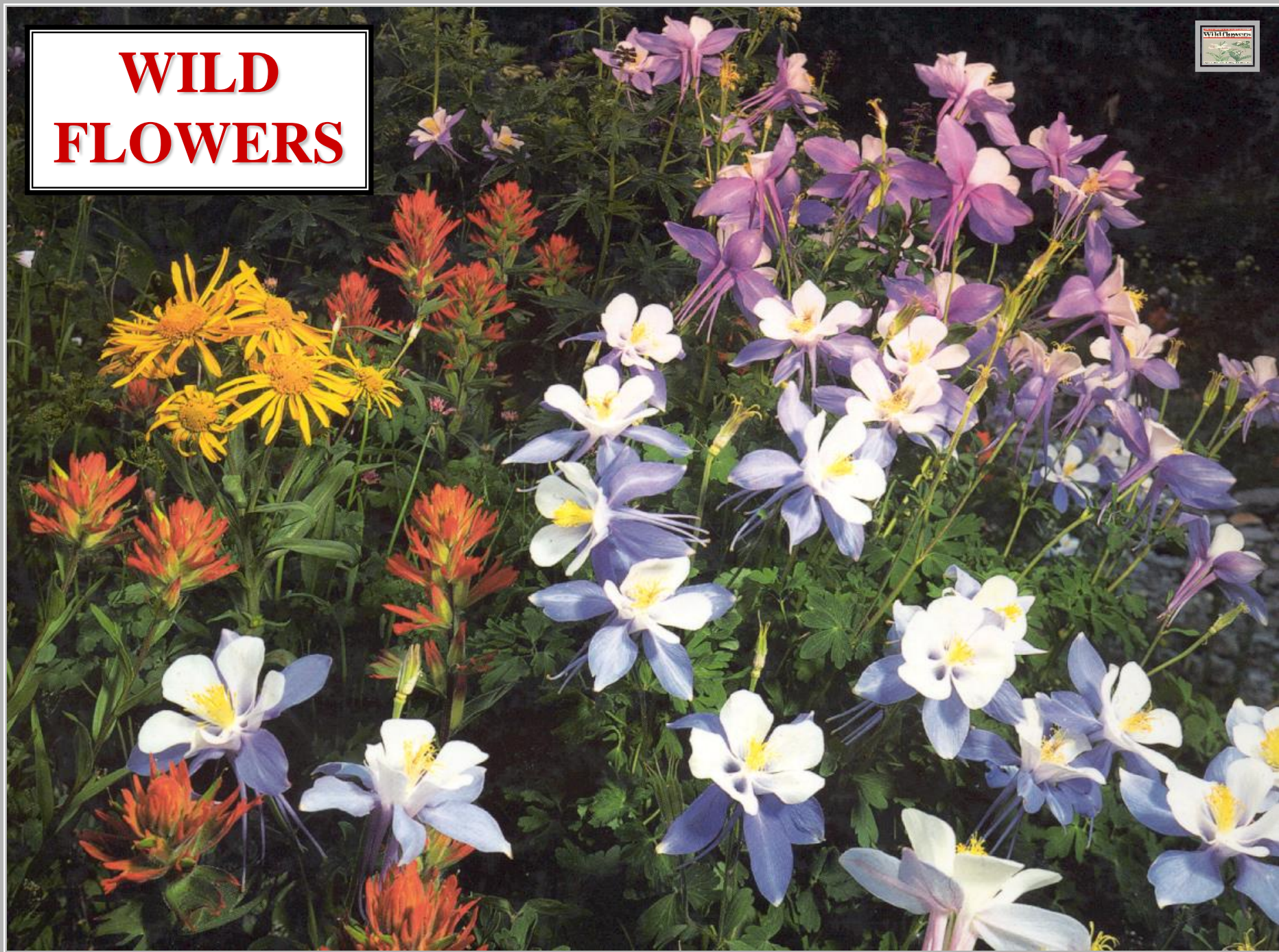
ARTIFICIAL CLASSIFICATION



BASED ON FEW CHARACTERS
LOW CHARACTER CORRELATION
GROUPS UNRELATED ORGANISMS
DESIGNED FOR NON-SCIENTIST
EG WILD-FLOWER GUIDE

ARTIFICIAL CLASSIFICATION

WILD FLOWERS



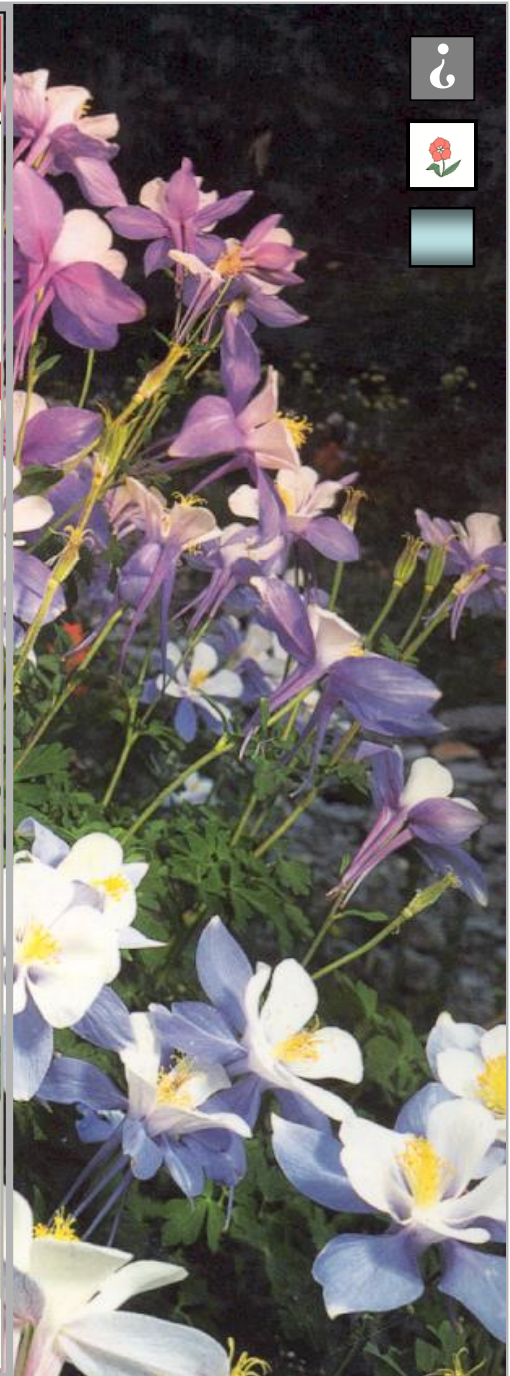
PETERSON FIELD GUIDES

Wildflowers

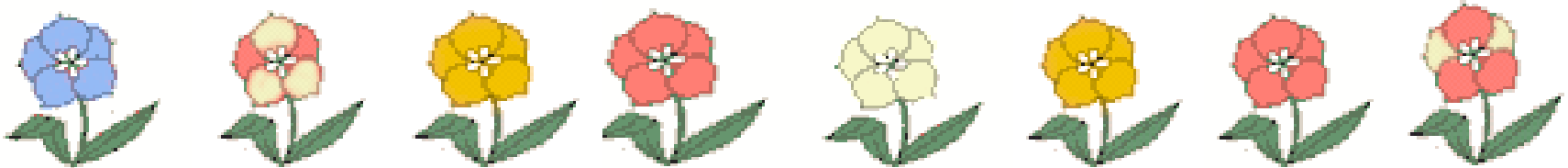
NORTHEASTERN/NORTHCENTRAL NORTH AMERICA



Roger Tory Peterson / Margaret McKenny

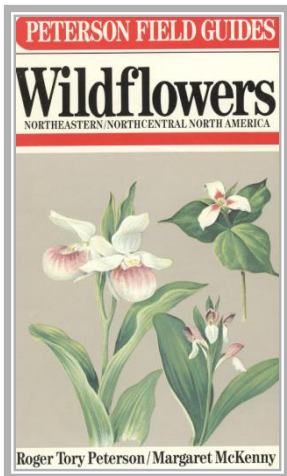


ARTIFICIAL CLASSIFICATION



**BASED ON
FLOWER COLOR**

**WILD
FLOWERS**





**PETALS
ALL RED**

**PETALS
3 RED**

**PETALS
2 RED**

**PETALS
YELLOW**

**PETALS
WHITE**

**PETALS
BLUE**

RED PETALS PRESENT

RED PETALS ABSENT

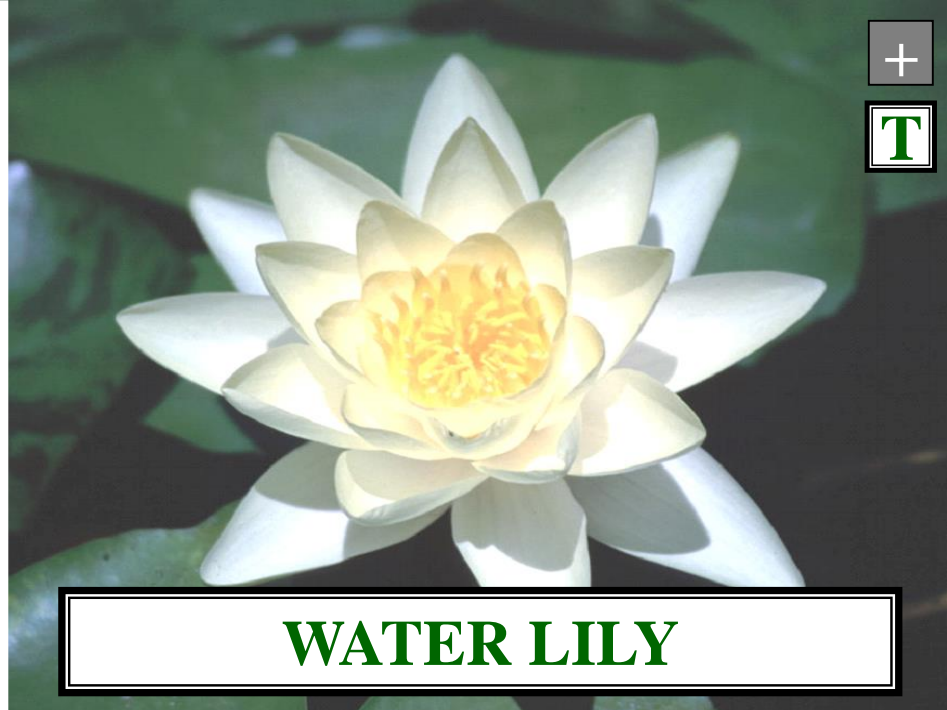
**ARTIFICIAL
CLASSIFICATION**

**WILD
FLOWERS**



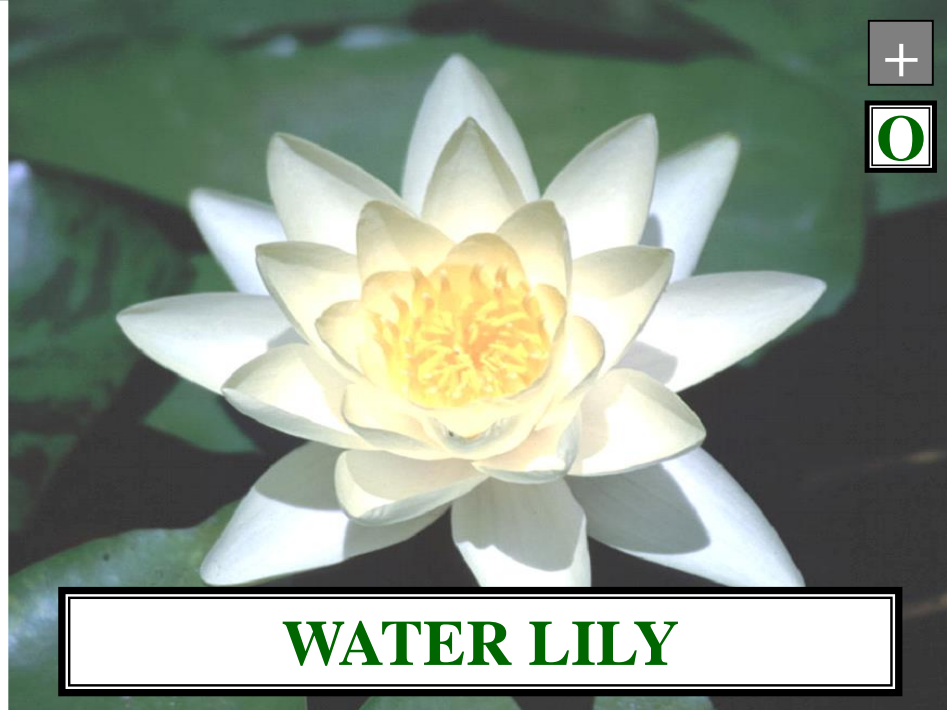








MAGNOLIA

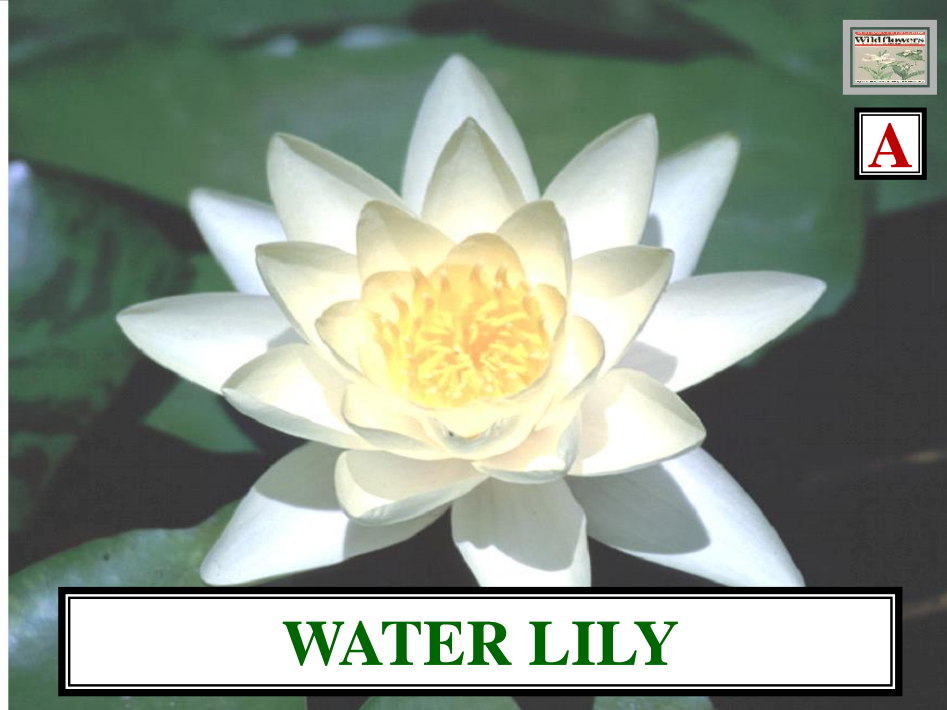


WATER LILY



TRILLIUM





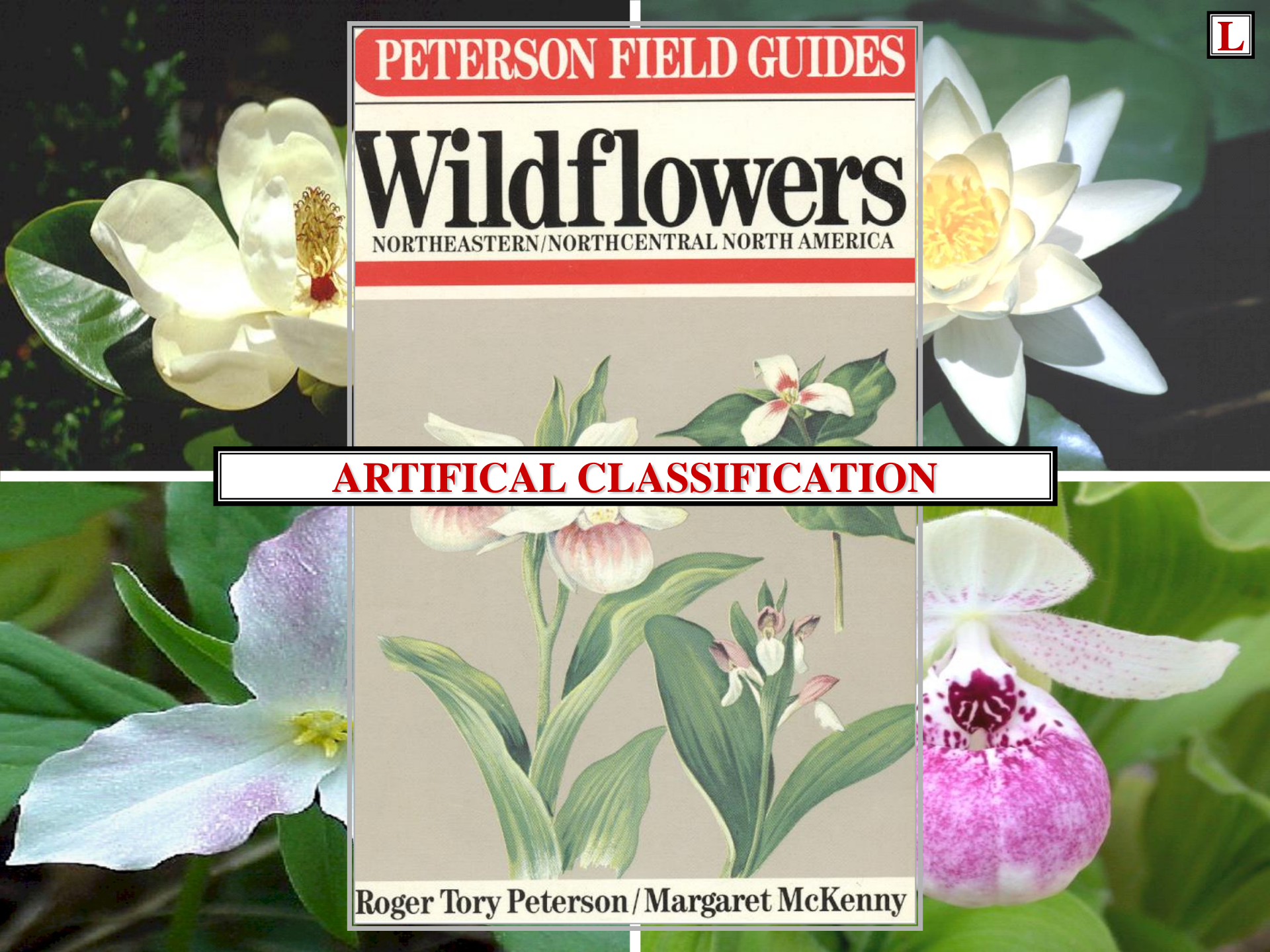
PETERSON FIELD GUIDES

Wildflowers

NORTHEASTERN/NORTHCENTRAL NORTH AMERICA

ARTIFICIAL CLASSIFICATION

Roger Tory Peterson / Margaret McKenny



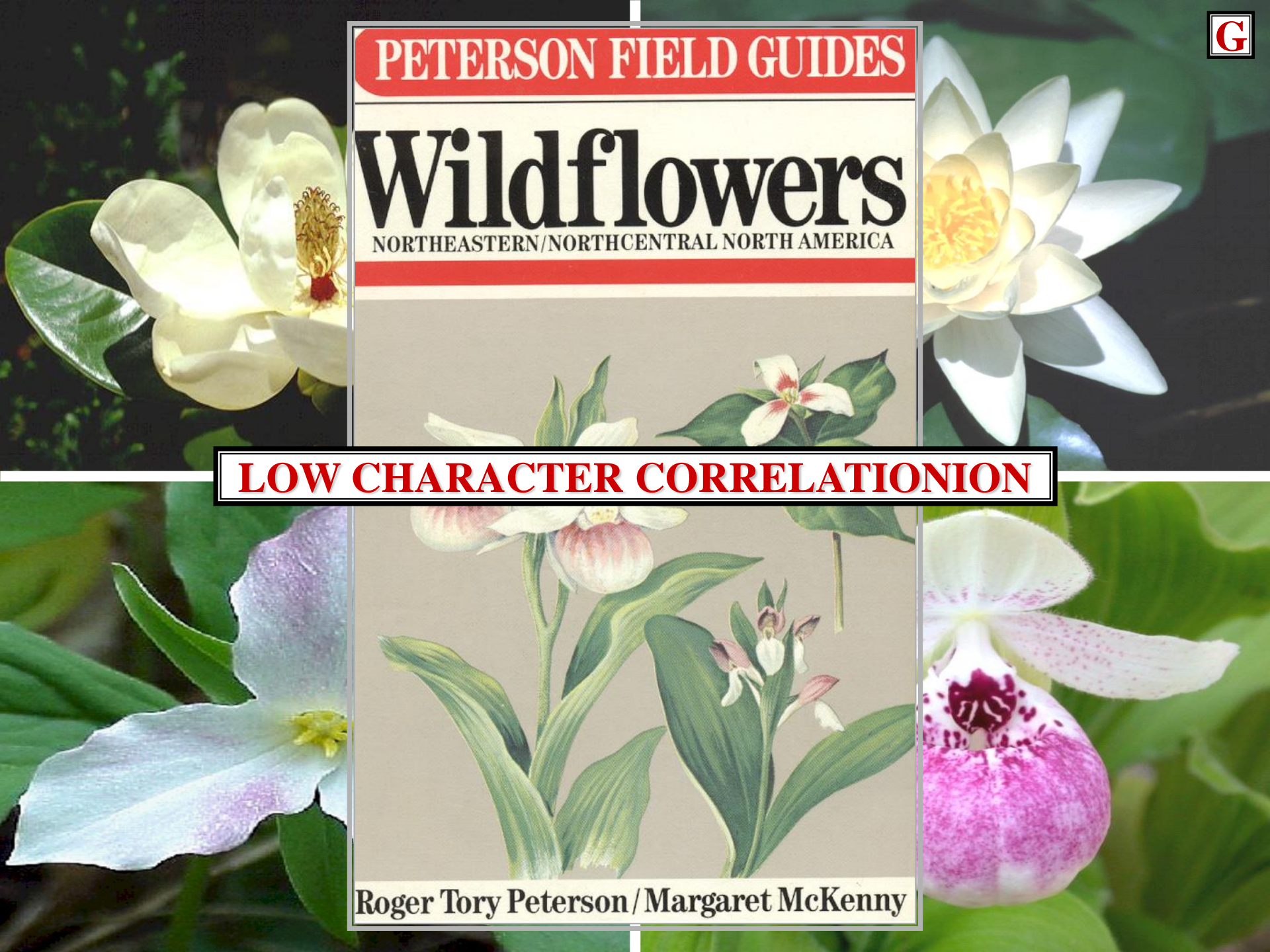
PETERSON FIELD GUIDES

Wildflowers

NORTHEASTERN/NORTHCENTRAL NORTH AMERICA

LOW CHARACTER CORRELATIONION

Roger Tory Peterson / Margaret McKenny



PETERSON FIELD GUIDES

Wildflowers

NORTHEASTERN/NORTHCENTRAL NORTH AMERICA

GROUPS UNRELATED ORGANISMS

Roger Tory Peterson / Margaret McKenny



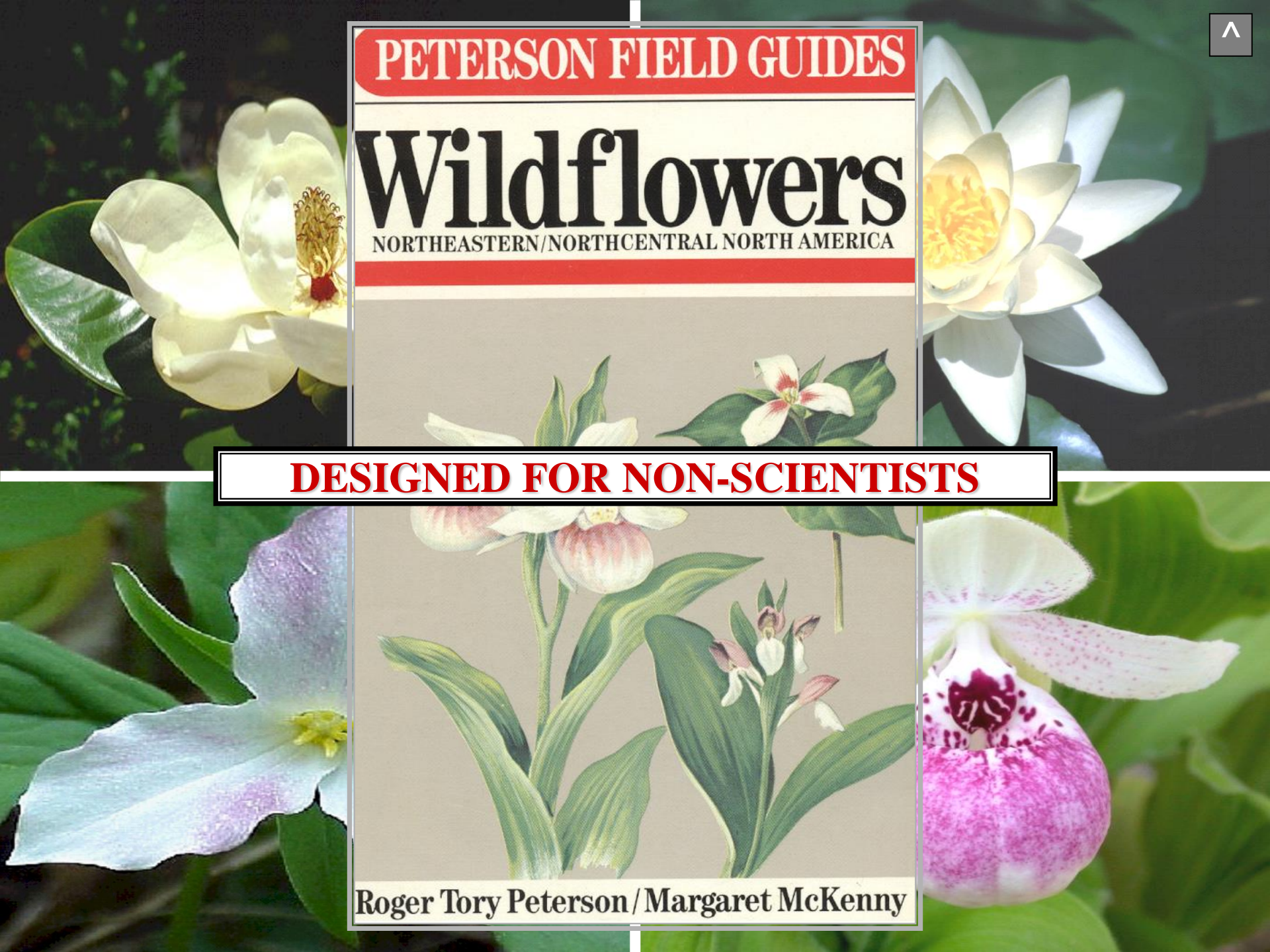
PETERSON FIELD GUIDES

Wildflowers

NORTHEASTERN/NORTHCENTRAL NORTH AMERICA

DESIGNED FOR NON-SCIENTISTS

Roger Tory Peterson / Margaret McKenny



NATURAL CLASSIFICATION

NATURAL CLASSIFICATION



NATURAL CLASSIFICATION

BASED ON MANY CHARACTERS

NATURAL CLASSIFICATION



NATURAL CLASSIFICATION

BASED ON MANY CHARACTERS
HIGH CHARACTER CORRELATION

NATURAL CLASSIFICATION



NATURAL CLASSIFICATION

**BASED ON MANY CHARACTERS
HIGH CHARACTER CORRELATION
GROUPS RELATED ORGANISMS**

NATURAL CLASSIFICATION



NATURAL CLASSIFICATION

**BASED ON MANY CHARACTERS
HIGH CHARACTER CORRELATION
GROUPS RELATED ORGANISMS
DESIGNED FOR SCIENTISTS**

NATURAL CLASSIFICATION



NATURAL CLASSIFICATION

**BASED ON MANY CHARACTERS
HIGH CHARACTER CORRELATION
GROUPS RELATED ORGANISMS
DESIGNED FOR SCIENTISTS
EG SCIENTIFIC WORKS**

NATURAL CLASSIFICATION

Flora of North America

North of Mexico

Edited by FLORA OF NORTH AMERICA EDITORIAL COMMITTEE

VOLUME 23

Magnoliophyta: Commelinidae (in part): Cyperaceae



NEW YORK OXFORD • OXFORD UNIVERSITY PRESS • 2002





ORCHIDS



Flora of North America

North of Mexico



NATURAL CLASSIFICATION

Edited by FLORA OF NORTH AMERICA EDITORIAL COMMITTEE

VOLUME 23

Magnoliophyta: Commelinidae (in part): Cyperaceae



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Flora of North America

North of Mexico



HIGH CHARACTER CORRELATIONION

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VOLUME 23

Magnoliophyta: Commelinidae (in part): Cyperaceae



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Flora of North America

North of Mexico



GROUPS RELATED ORGANISMS

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VOLUME 23

Magnoliophyta: Commelinidae (in part): Cyperaceae



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Flora of North America

North of Mexico

?

DESIGNED FOR SCIENTISTS

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VOLUME 23

Magnoliophyta: Commelinidae (in part): Cyperaceae



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QUESTION

**BOTANISTS PREFER
ARTIFICIAL CLASSIFICATION
OR
NATURAL CLASSIFICATION?**

QUESTION

A close-up photograph of a white magnolia flower with a prominent yellow stamen and a red pistil, surrounded by dark green, glossy leaves. The background is dark and out of focus.

**BOTANISTS
PREFER
NATURAL
CLASSIFICATION**



**NATURAL
CLASSIFICATION
SPECIFICS**



**HOMOLOGOUS
CHARACTERS
VS
ANALOGOUS
CHARACTERS**

HOMOLOGOUS CHARACTERS

HOMOLOGOUS CHARACTERS



HOMOLOGOUS CHARACTERS

ATTRIBUTED COMMON ANCESTRY

HOMOLOGOUS CHARACTERS

HOMOLOGOUS CHARACTERS



ATTRIBUTED COMMON ANCESTRY
SIMILAR STRUCTURE

HOMOLOGOUS
CHARACTERS



HOMOLOGOUS CHARACTERS

**ATTRIBUTED COMMON ANCESTRY
SIMILAR STRUCTURE
SIMILAR FUNCTION**

HOMOLOGOUS CHARACTERS

HOMOLOGOUS CHARACTERS



ATTRIBUTED COMMON ANCESTRY
SIMILAR STRUCTURE
SIMILAR FUNCTION
SAME ONTOGENY = ANCESTRY/DEVELOPMENT

HOMOLOGOUS CHARACTERS



HOMOLOGOUS CHARACTERS

ATTRIBUTED COMMON ANCESTR

SIMILAR STRUCTURE

SIMILAR FUNCTION

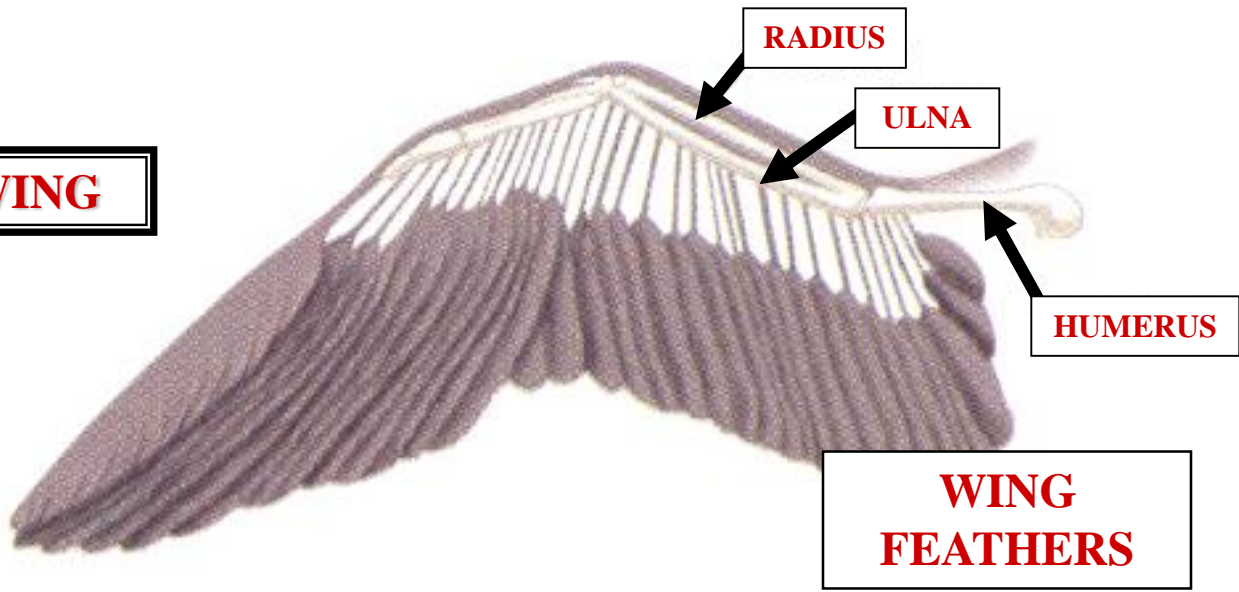
SAME ONTOGENY = ANCESTRY/DEVELOPMENT

EG HUMERUS

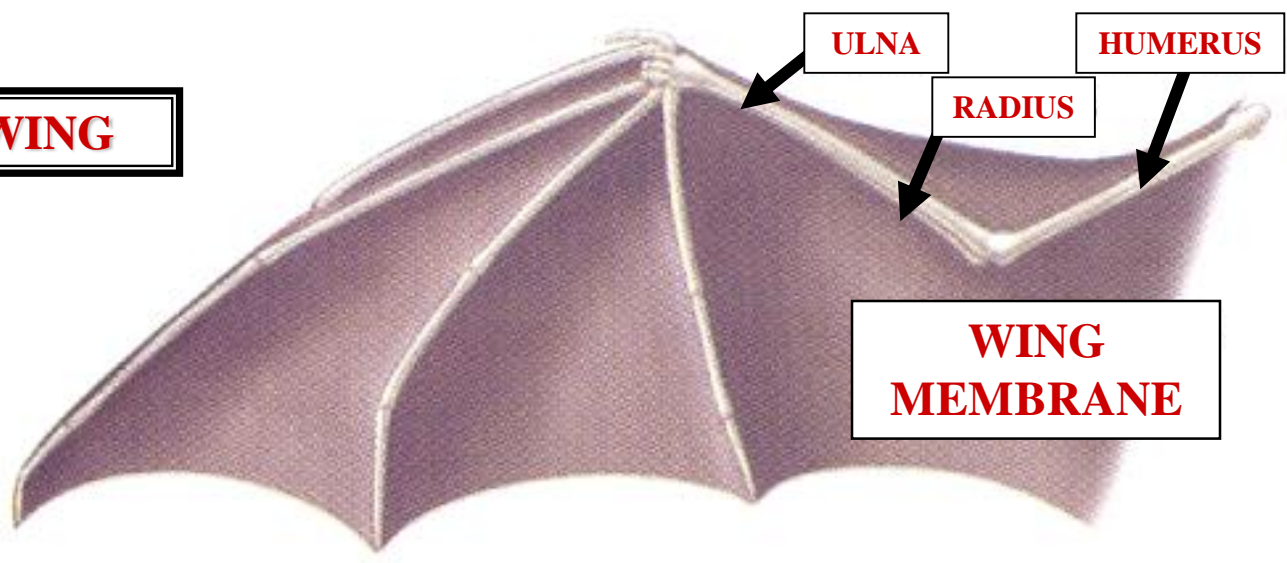
HOMOLOGOUS CHARACTERS

HOMOLOGOUS CHARACTERS

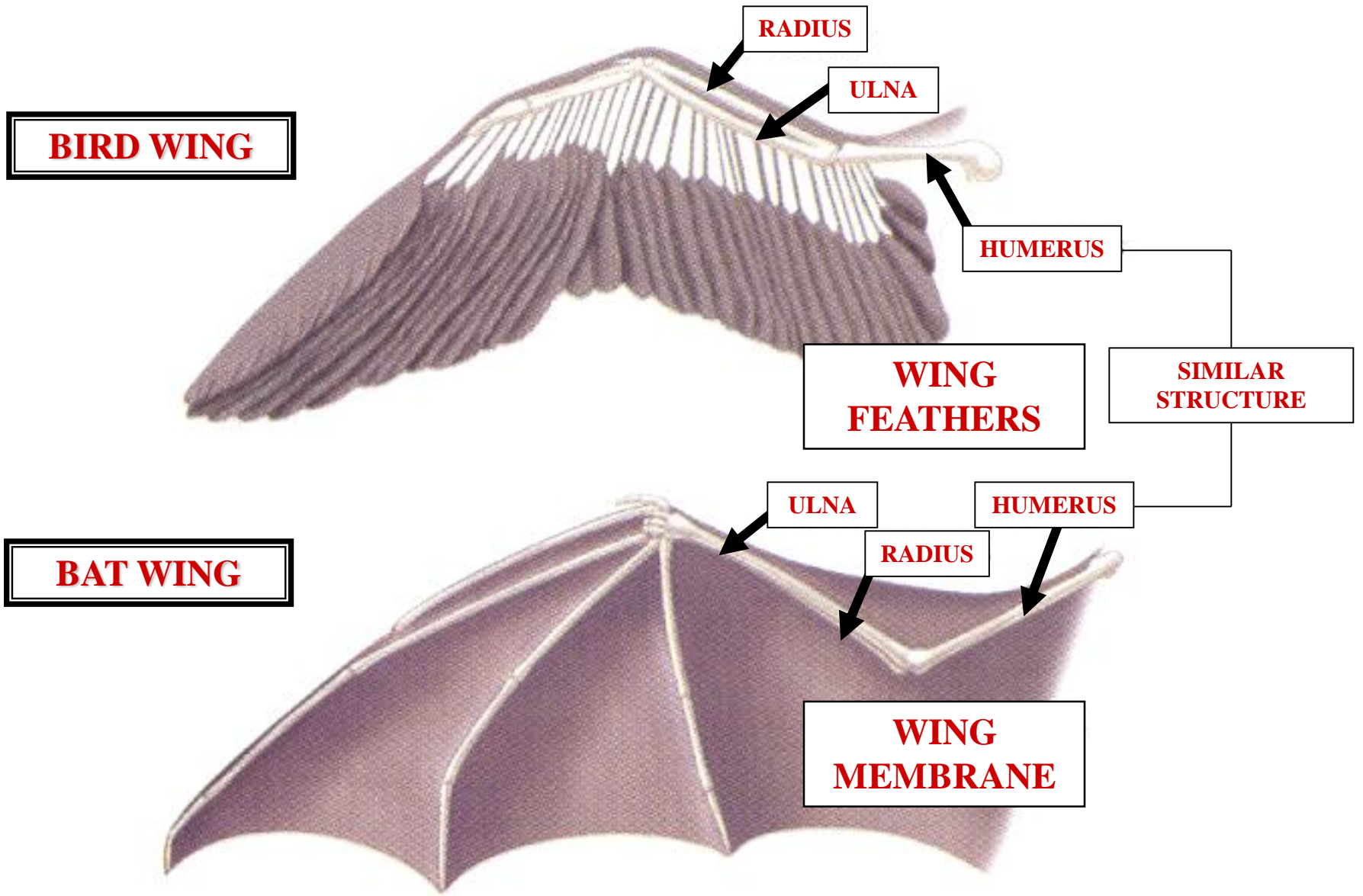
BIRD WING



BAT WING



HOMOLOGOUS CHARACTERS



BIRD WING

BAT WING

RADIUS

ULNA

HUMERUS

WING FEATHERS

SIMILAR STRUCTURE

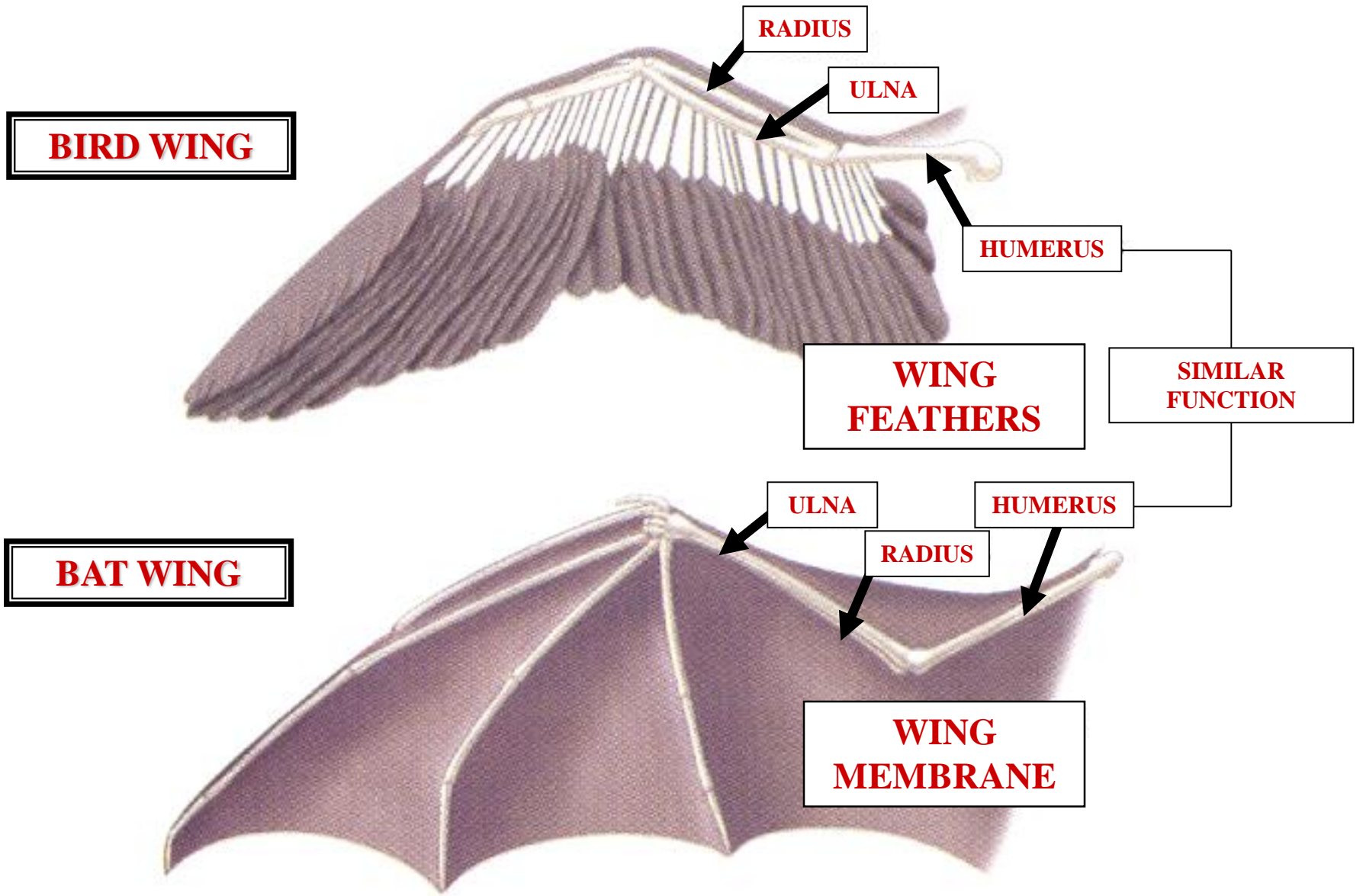
ULNA

HUMERUS

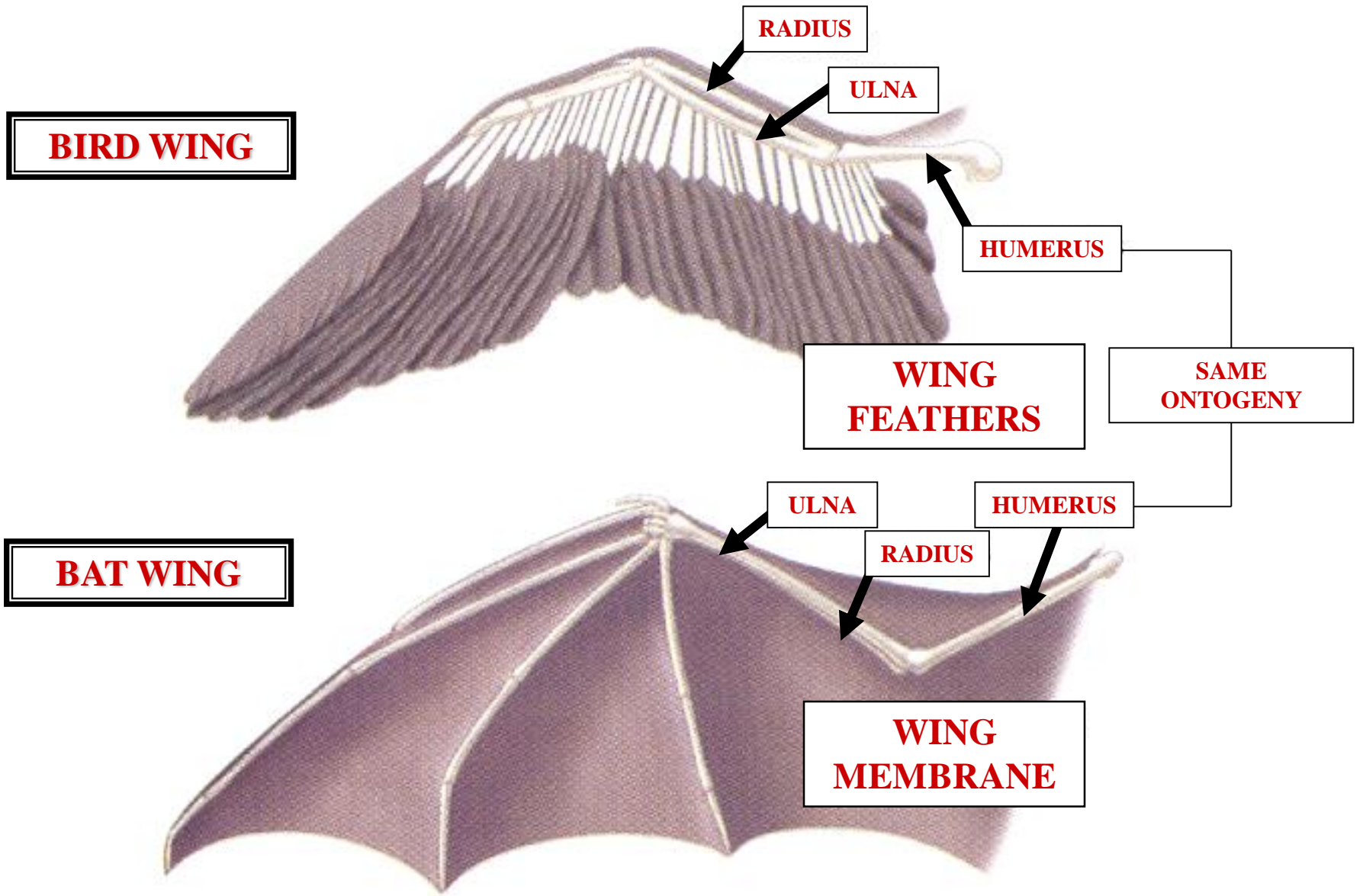
RADIUS

WING MEMBRANE

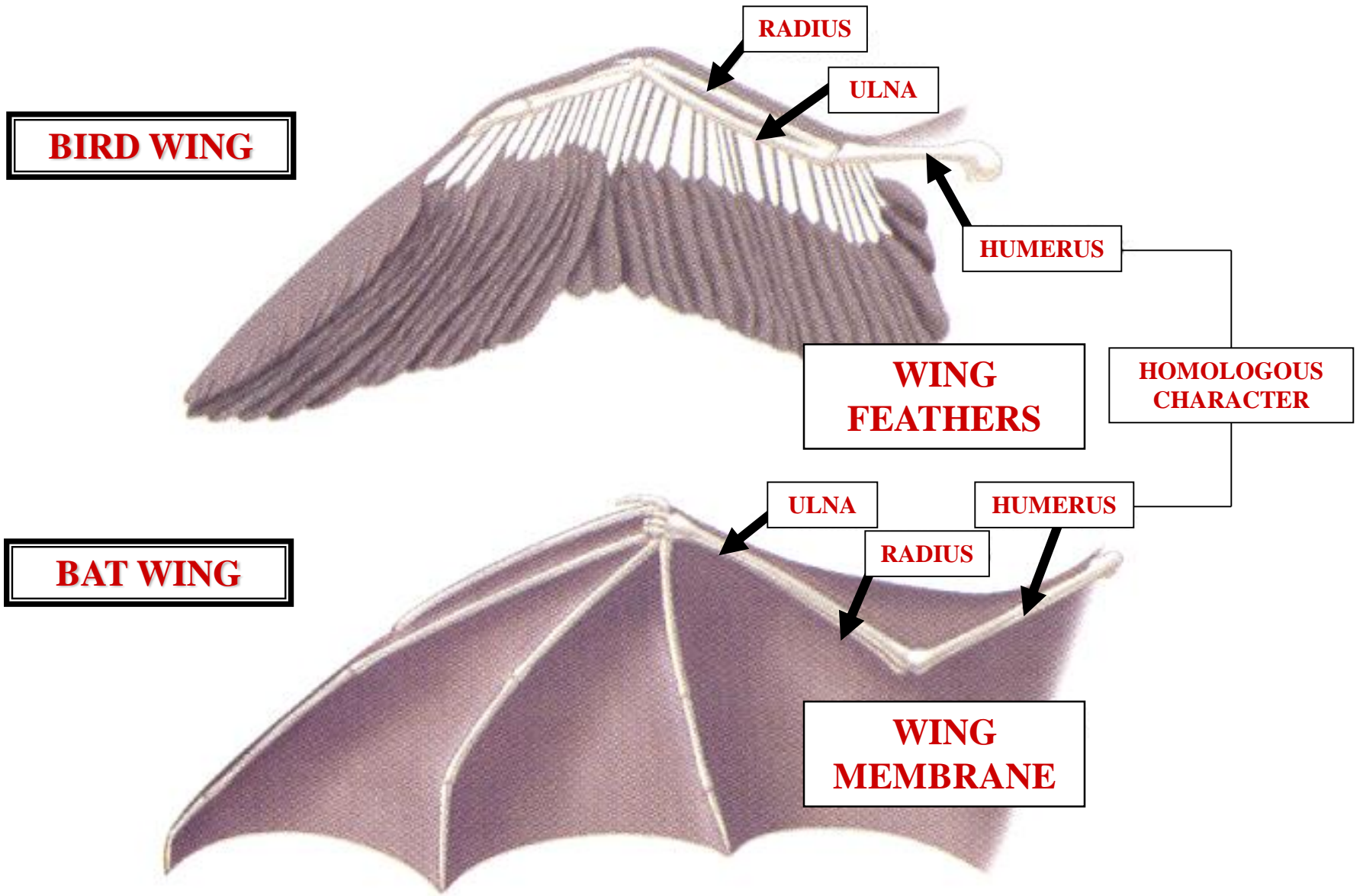
HOMOLOGOUS CHARACTERS



HOMOLOGOUS CHARACTERS



HOMOLOGOUS CHARACTERS



ANALOGOUS CHARACTERS

ANALOGOUS CHARACTERS



ANALOGOUS CHARACTERS

NOT ATTRIBUTED COMMON ANCESTRY

ANALOGOUS CHARACTERS



ANALOGOUS CHARACTERS

**NOT ATTRIBUTED COMMON ANCESTRY
SIMILAR FUNCTION**

ANALOGOUS CHARACTERS



ANALOGOUS CHARACTERS

**NOT ATTRIBUTED COMMON ANCESTRY
SIMILAR FUNCTION
DIFFERENT STRUCTURE**

ANALOGOUS CHARACTERS

ANALOGOUS CHARACTERS

NOT ATTRIBUTED COMMON ANCESTRY

SIMILAR FUNCTION

DIFFERENT STRUCTURE

DIFFERENT ONTOGENY = ANCESTRY/DEVELOPMENT

ANALOGOUS CHARACTERS

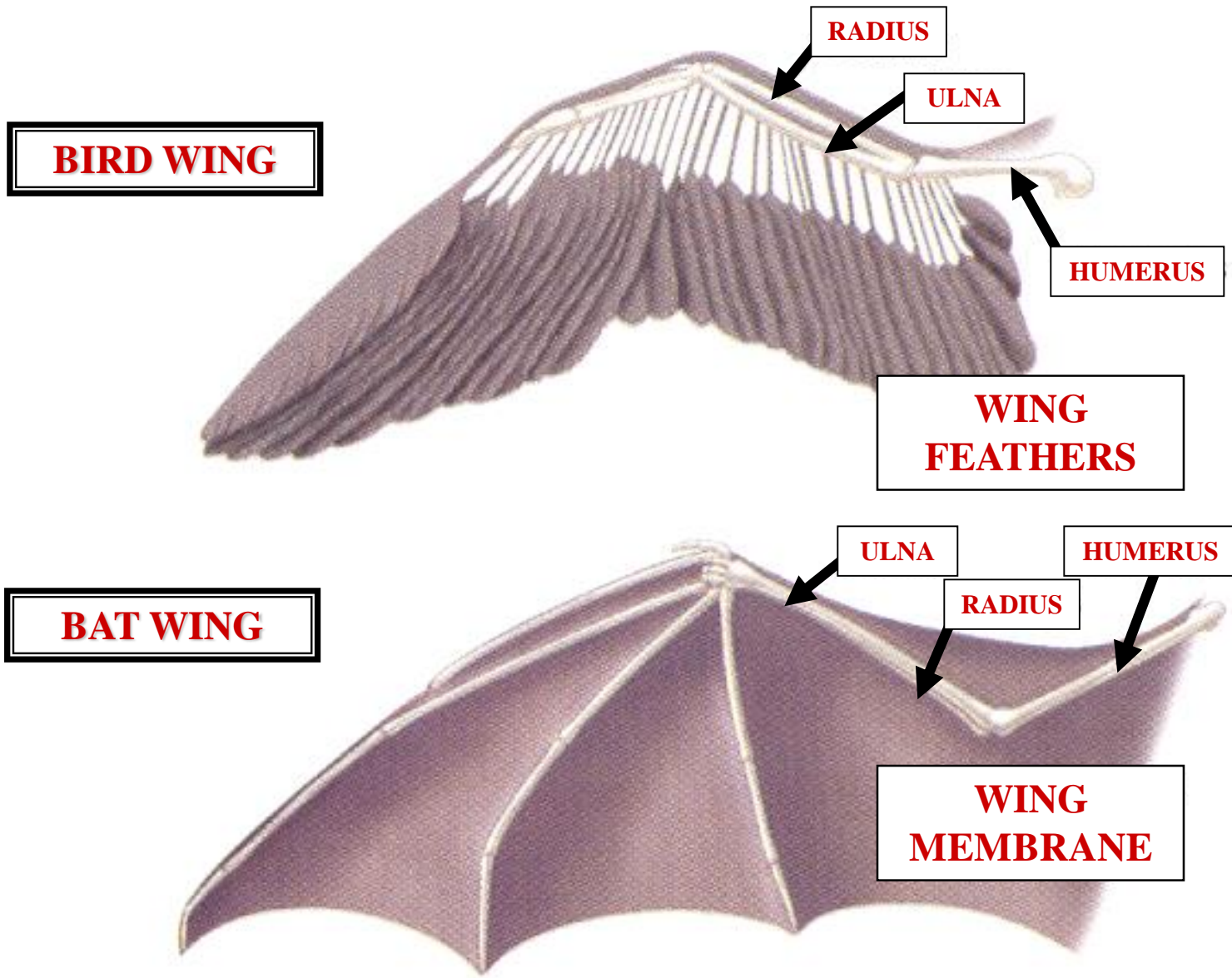


ANALOGOUS CHARACTERS

NOT ATTRIBUTED COMMON ANCESTRY
SIMILAR FUNCTION
DIFFERENT STRUCTURE
DIFFERENT ONTOGENY = ANCESTRY/DEVELOPMENT
EG BIRD & BAT WING

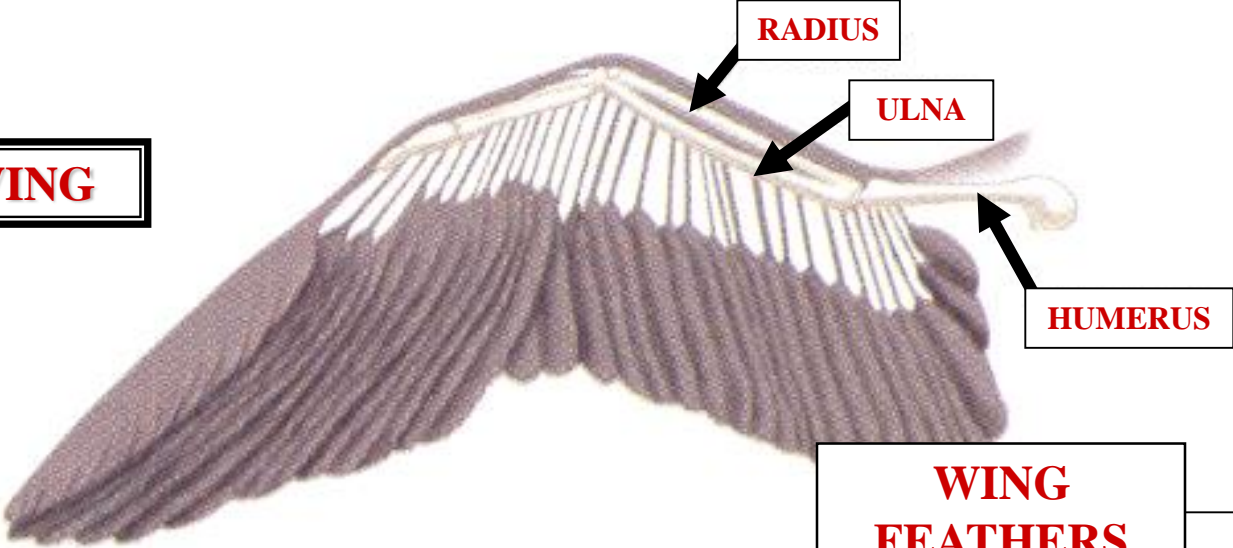
ANALOGOUS CHARACTERS

ANALOGOUS CHARACTERS

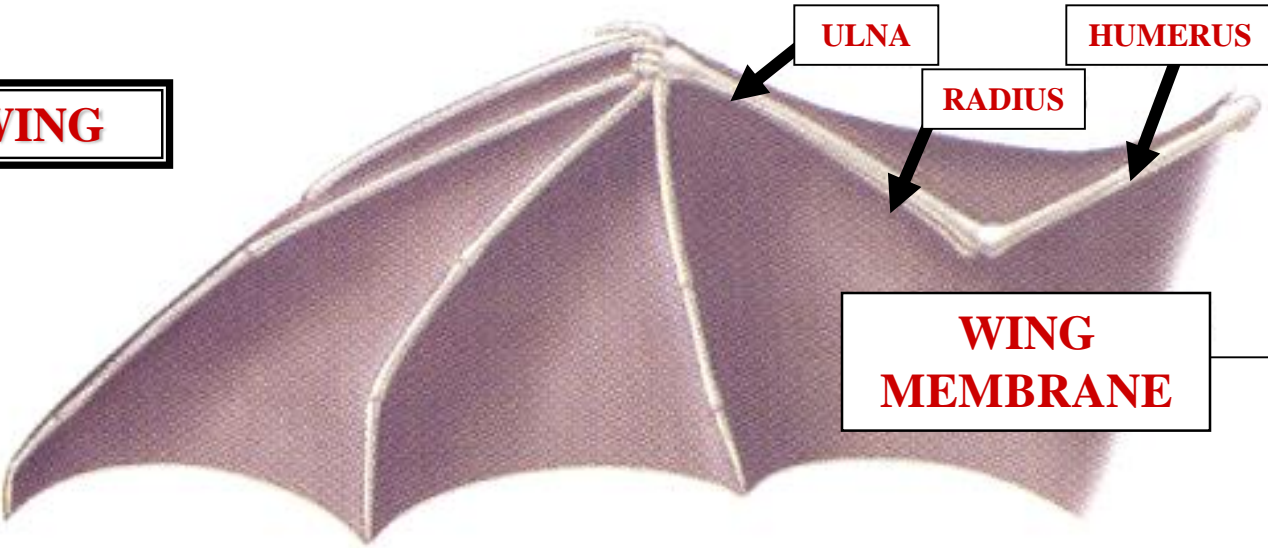


ANALOGOUS CHARACTERS

BIRD WING



BAT WING

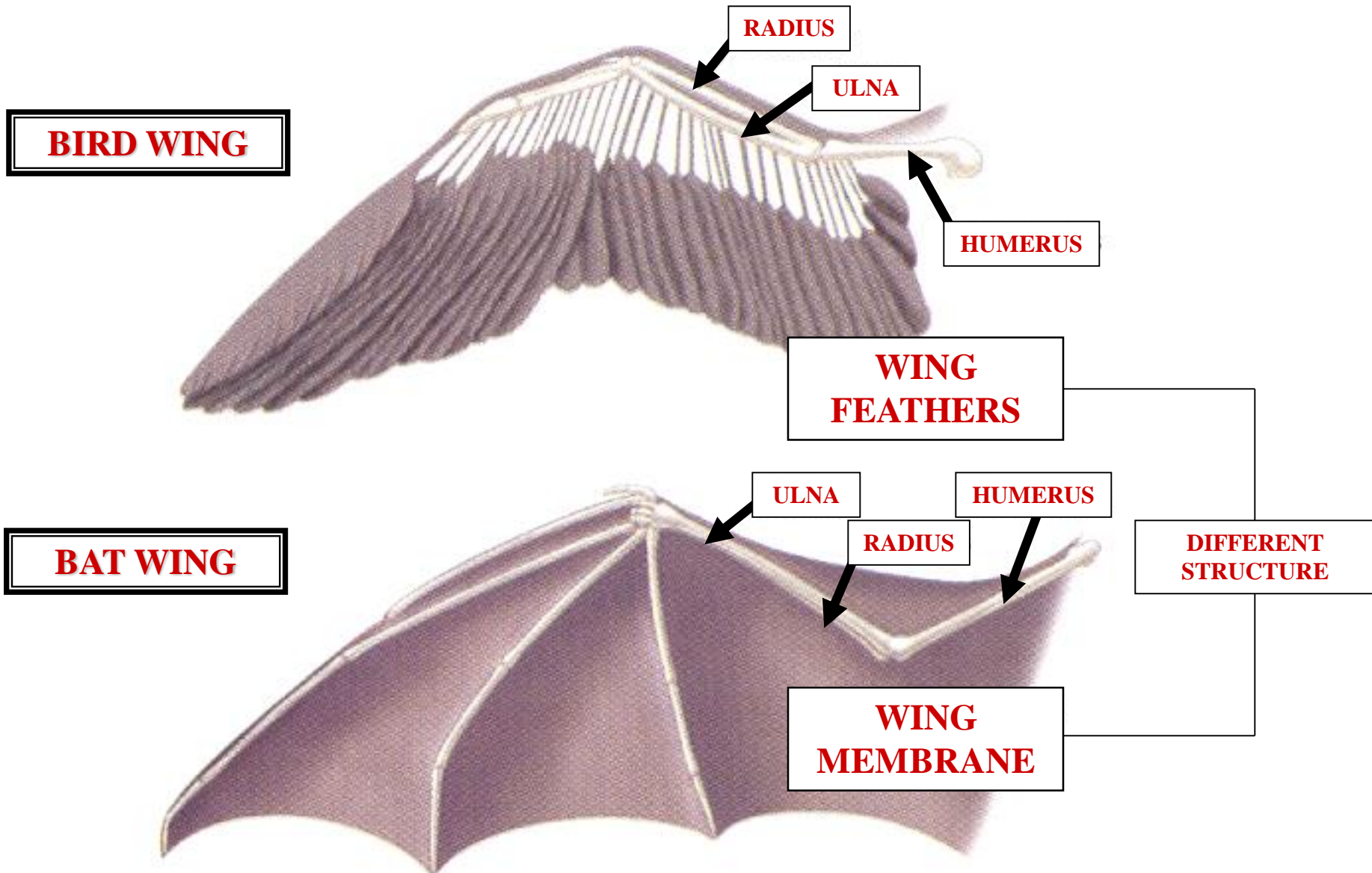


WING FEATHERS

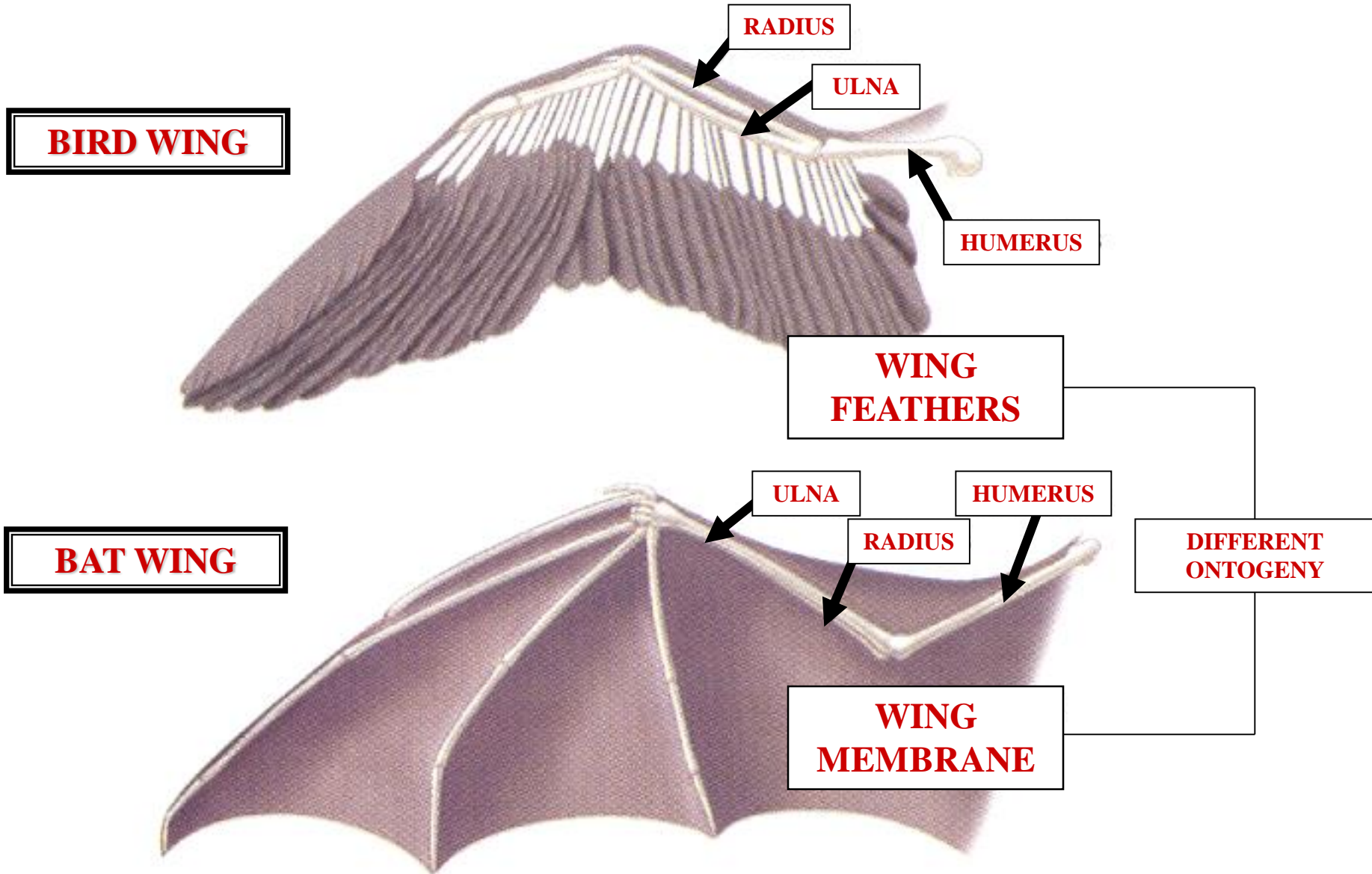
SIMILAR FUNCTION

WING MEMBRANE

ANALOGOUS CHARACTERS



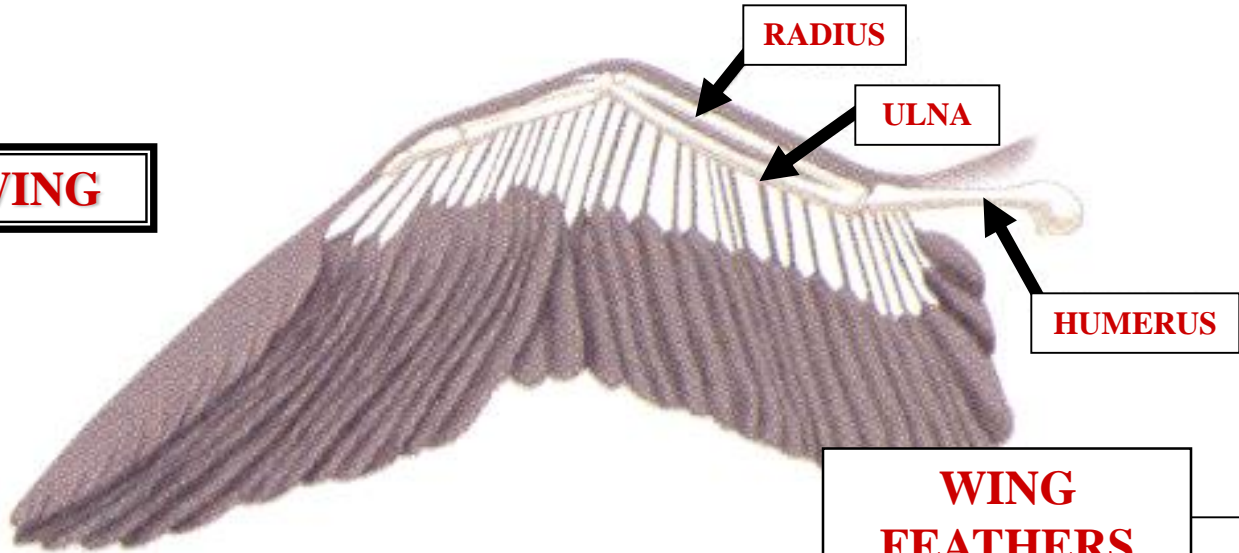
ANALOGOUS CHARACTERS



ANALOGOUS CHARACTERS



BIRD WING



WING FEATHERS

BAT WING



WING MEMBRANE

ANALOGOUS CHARACTER

CONVERGENT EVOLUTION

CONVERGENT EVOLUTION



CONVERGENT EVOLUTION

INDEPENDENT EVOLUTION
OF LIKE STRUCTURES BY
UNRELATED TAXA

CONVERGENT EVOLUTION

CONVERGENT EVOLUTION

DUE TO SIMILAR
ENVIRONMENT
SELECTIVE PRESSURES

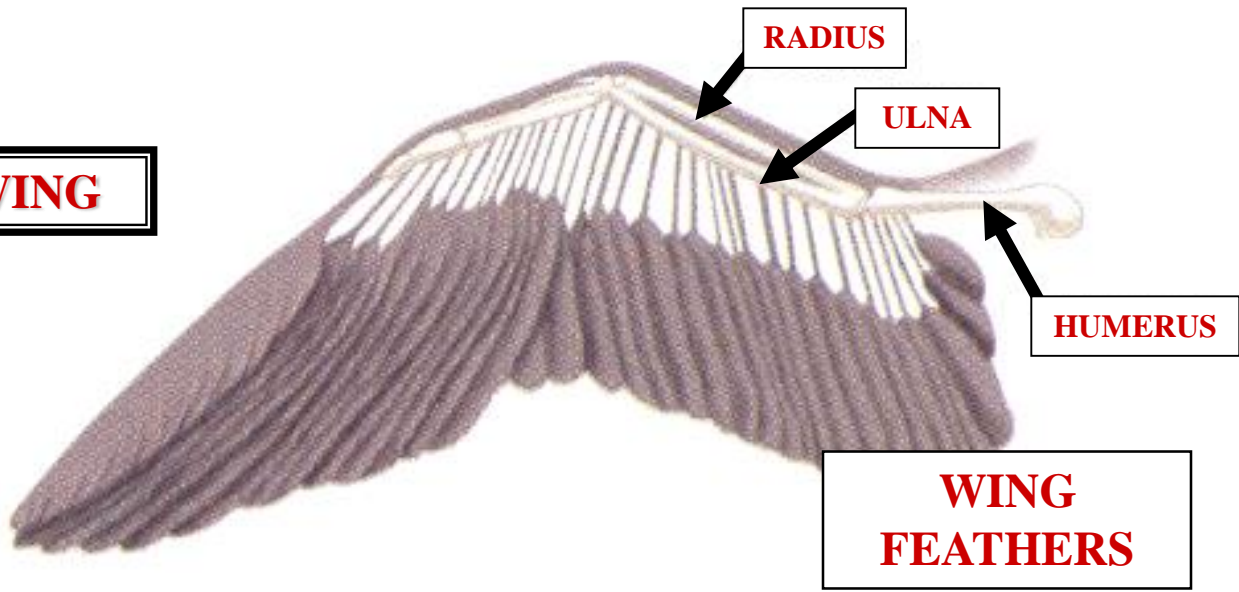
CONVERGENT EVOLUTION



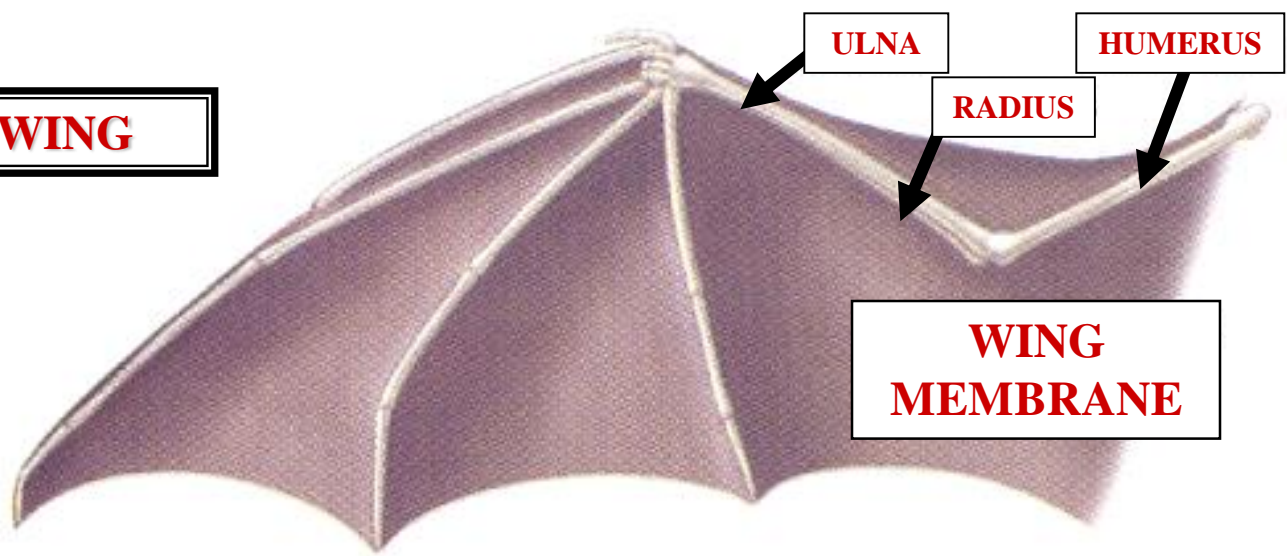
**EXAMPLE
CONVERGENT
EVOLUTION
ANIMALS**

CONVERGENT CHARACTERS

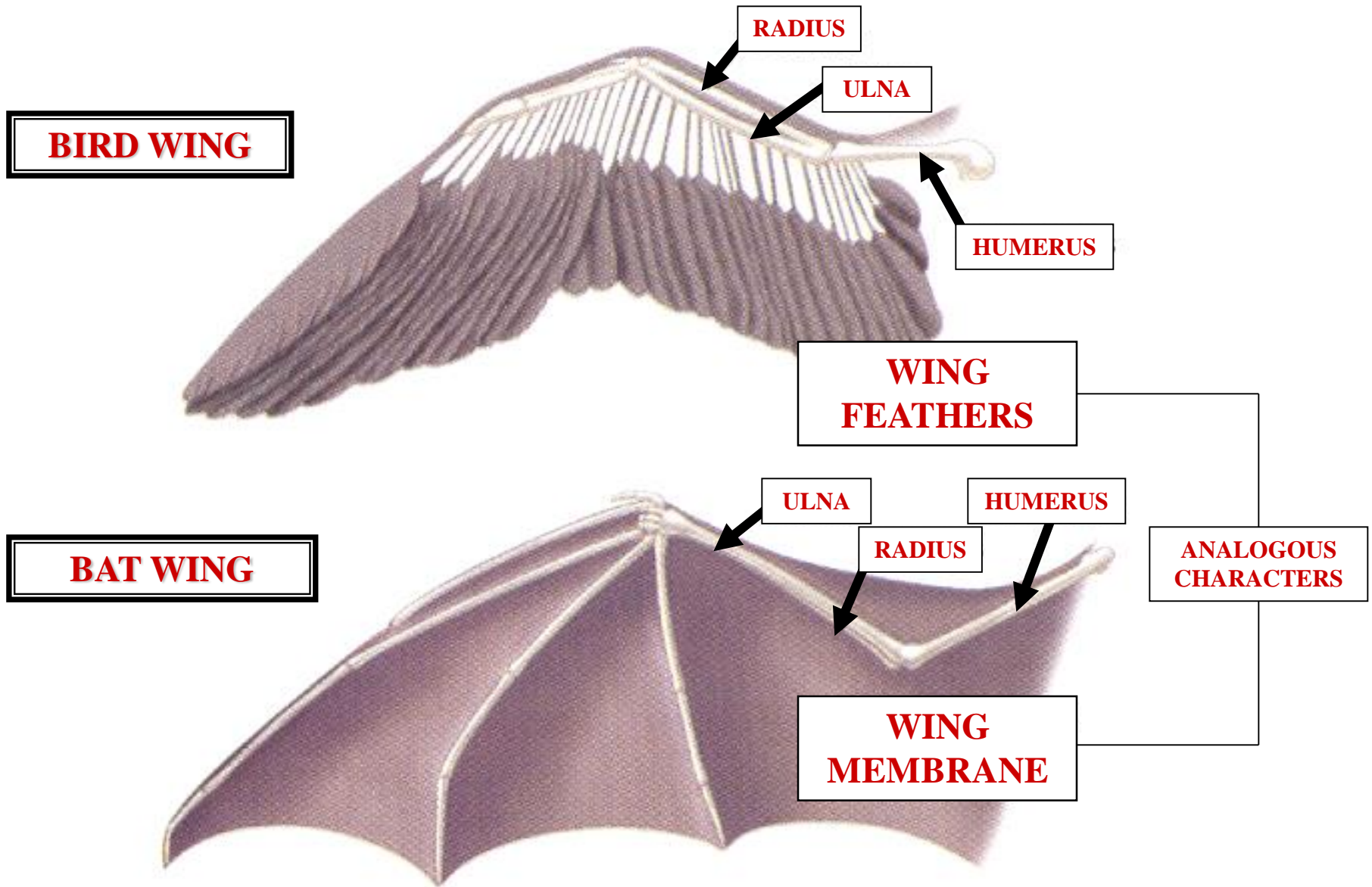
BIRD WING



BAT WING

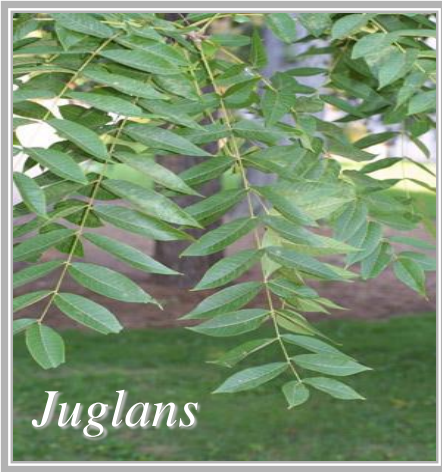


CONVERGENT CHARACTERS





**EXAMPLE
CONVERGENT
EVOLUTION
PLANTS**



PETIOLE

AXILLARY BUD



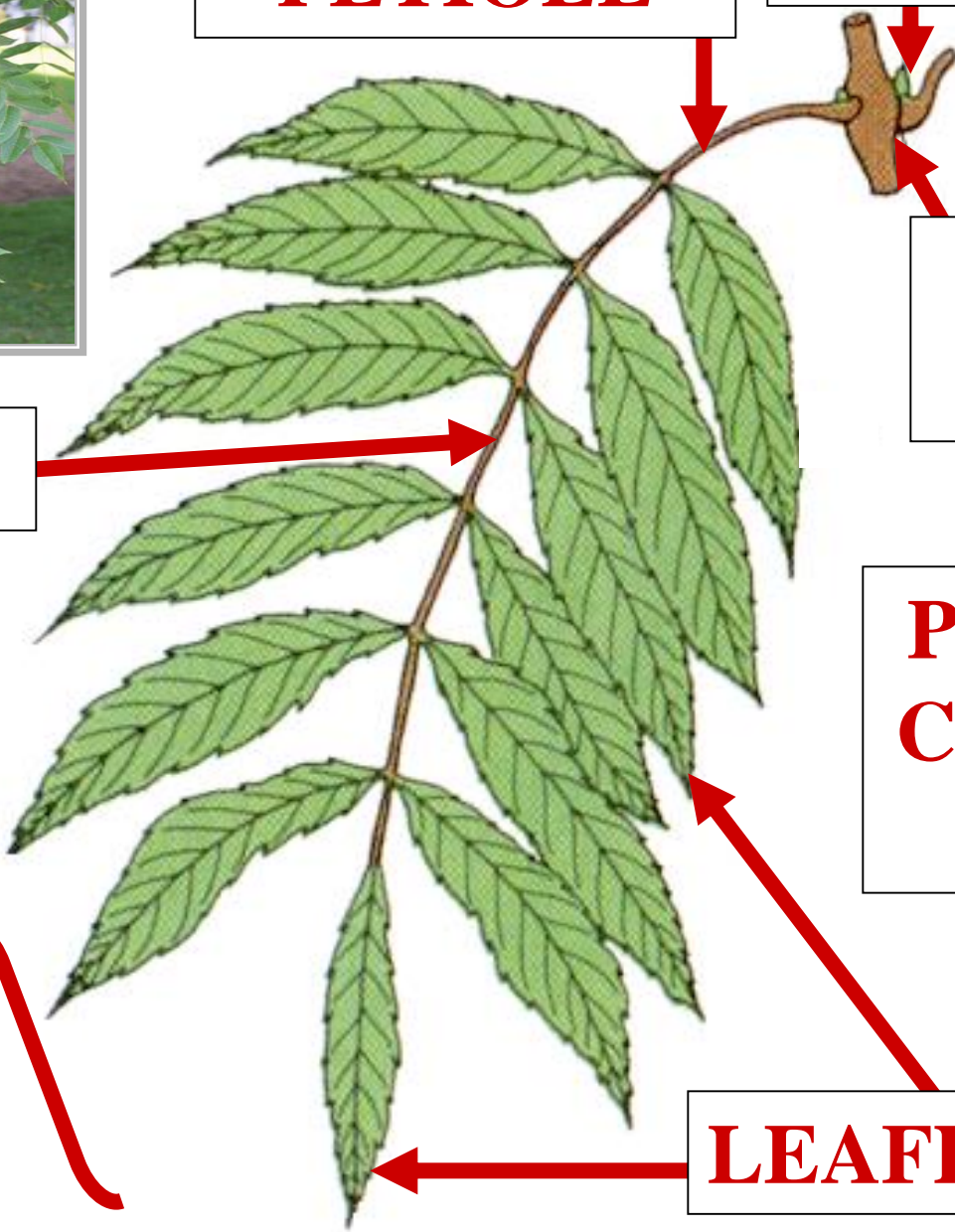
**STIPULES
ABSENT**

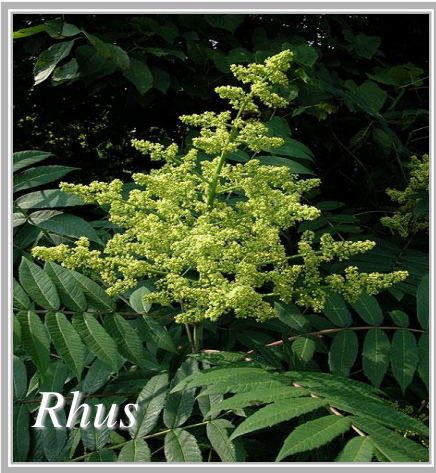
RACHIS

**PINNATELY
COMPOUND
LEAF**

LEAF

LEAFLETS





PETIOLE

AXILLARY BUD



A

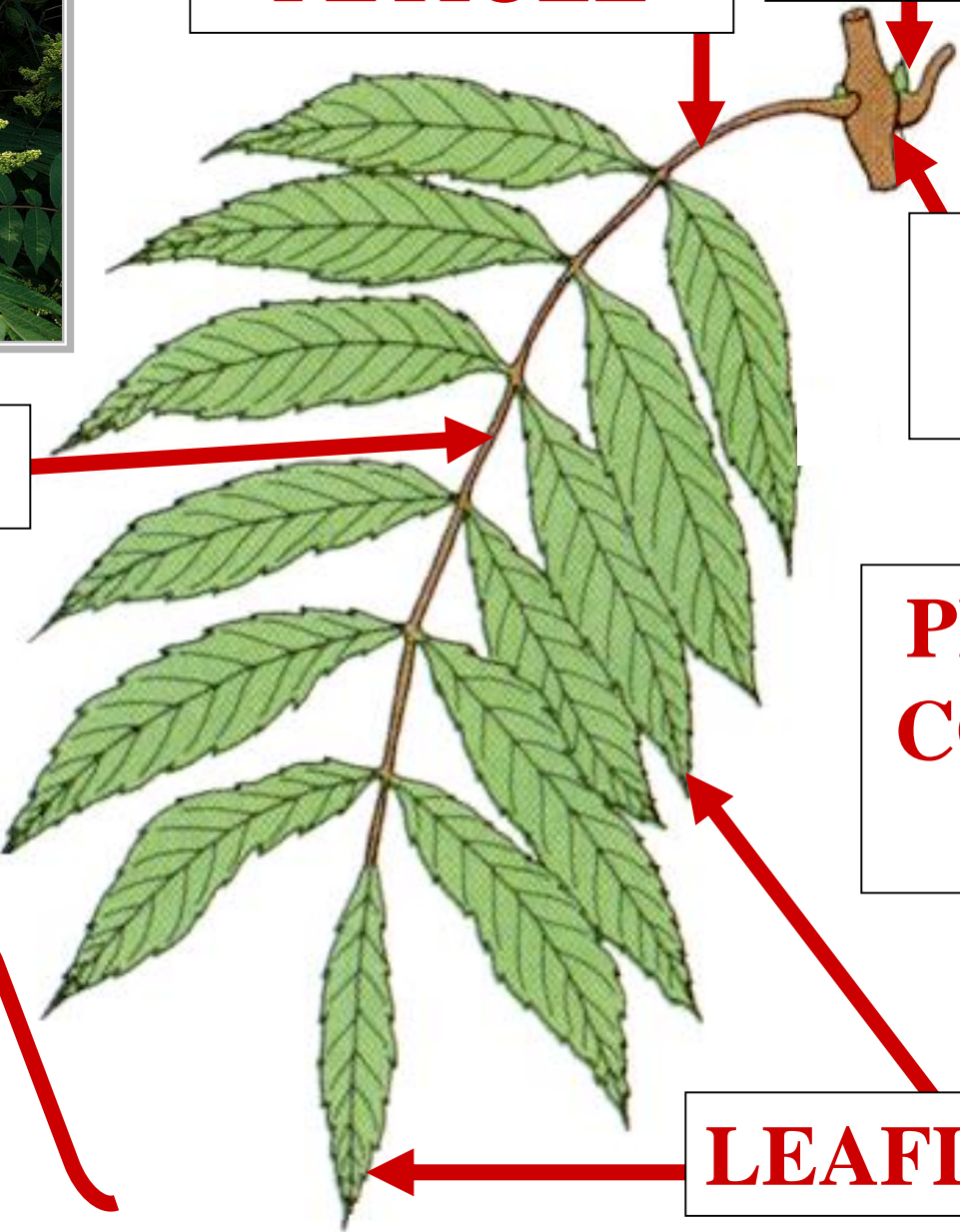
**STIPULES
ABSENT**

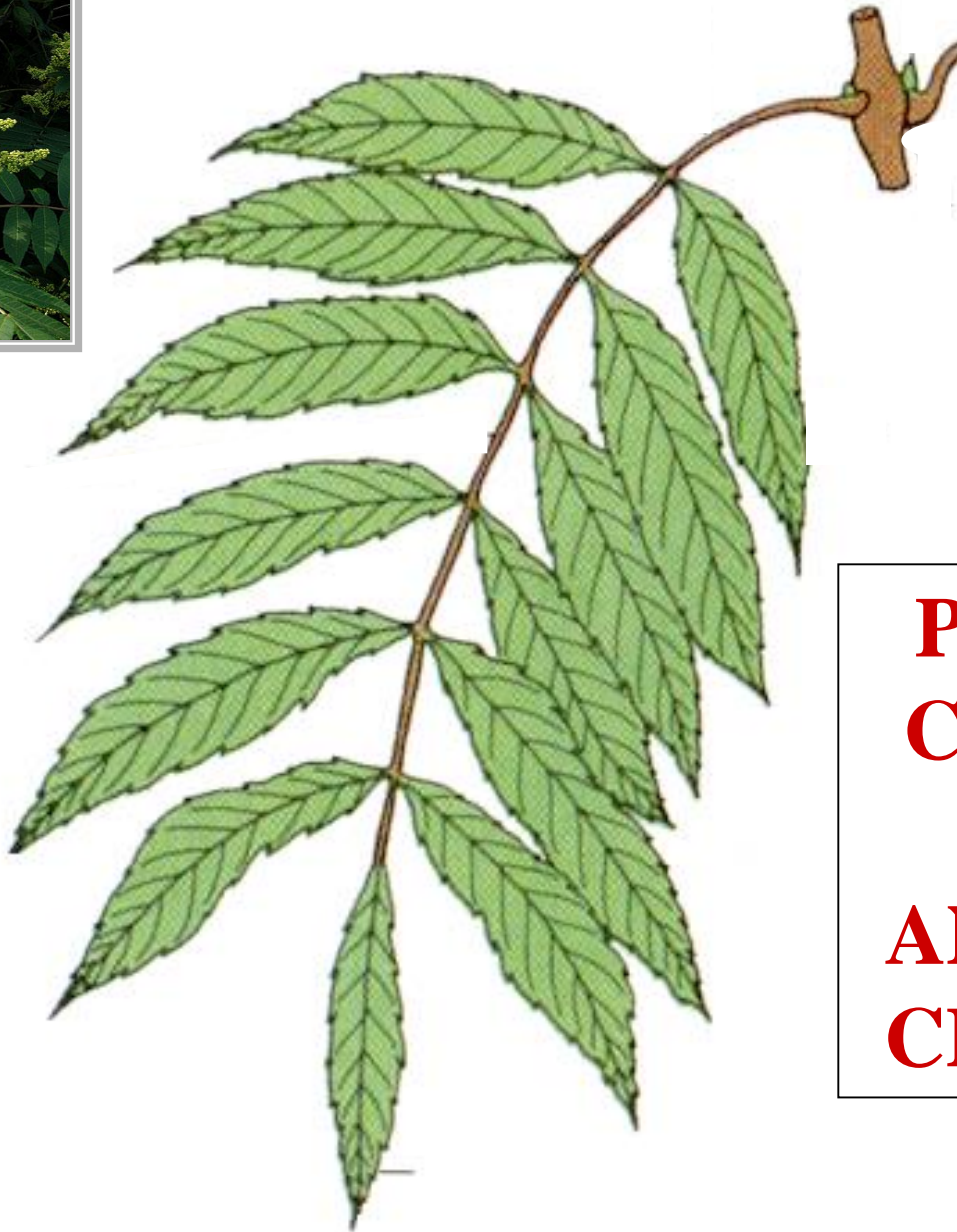
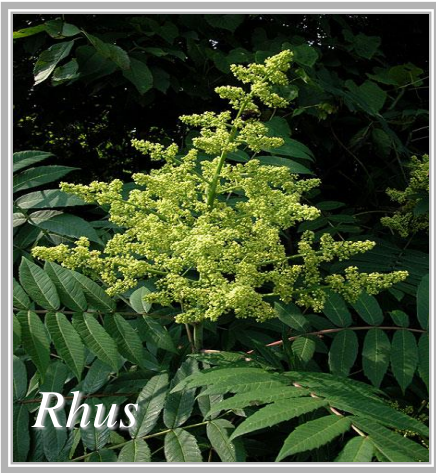
RACHIS

**PINNATELY
COMPOUND
LEAF**

LEAF

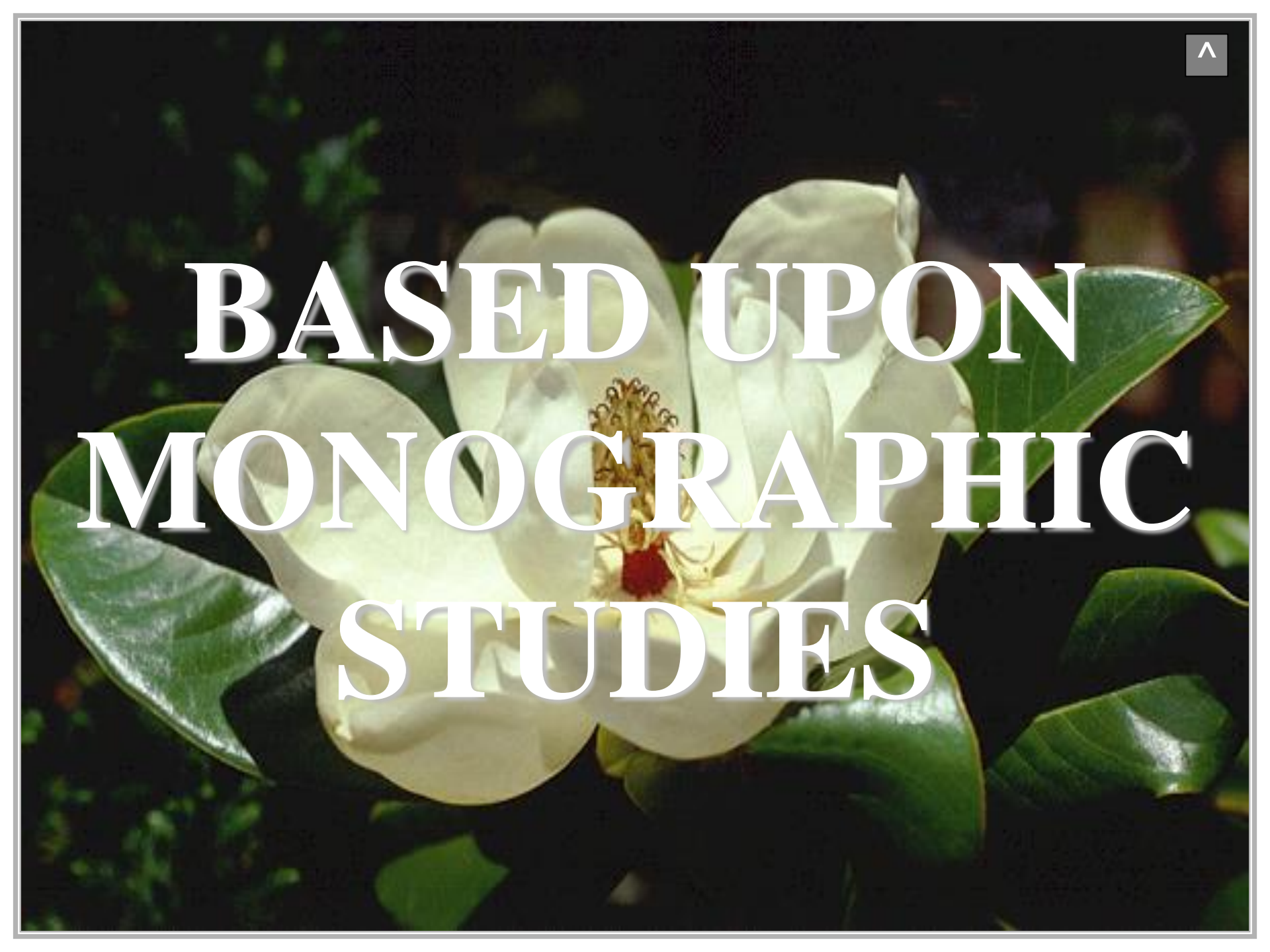
LEAFLETS





**PINNATELY
COMPOUND
LEAF
ANALOGOUS
CHARACTER**

**PHENETIC
CLASSIFICATION
VS
PHYLOGENETIC
CLASSIFICATION**

A close-up photograph of a white magnolia flower with a prominent yellow stamen and a red pistil, set against a dark background with green leaves. The text is overlaid on the flower.

BASED UPON MONOGRAPHIC STUDIES

**PHENETIC
NATURAL
CLASSIFICATION**

**PHENETIC
NATURAL
CLASSIFICATION**

**PHENETIC NATURAL
CLASSIFICATION**



**BASED ON CHARACTER
CORRELATION ONLY**

**PHENETIC NATURAL
CLASSIFICATION**

PHENETIC NATURAL CLASSIFICATION



ATTEMPT REFLECT OVERALL SIMILARITY

PHENETIC NATURAL
CLASSIFICATION

PHENETIC NATURAL CLASSIFICATION



ATTEMPT REFLECT OVERALL SIMILARITY

NO ATTEMPT REFLECT PHYLOGENY

PHENETIC NATURAL CLASSIFICATION