

hello students we are going now
to the same topic that is anatomy of
animal body systems of
the same unit unit 1 integumentary
system
dermal derivatives this is part 2 that
is module 13.
i am deeper fernandes in this topic
we will be studying the dermal
derivatives in vertebrates
the scales in cartilaginous and bony
fishes
and the scales and skews in tetrapods
as well as the dermal fin rays
at the end of the topic we will know
the outline of the different kinds of
dermal derivatives
we will be able to distinguish between
dermal scales
and scutes in tetrapods and
it will explain the kinds of fin rays
the scales of bony fish as we have seen
in the previous module we have already
started
with the scales of the primitive fishes
that is the cosmoid scale the ganoid
scale and the placoid scale
now we go to the modern day fish or the
bony fish or the teleost
now in the actinopterygian that is the bony
fish
the ganoin layer is lost and there is no
pulp cavity
these scales have a very thin layer of
isopedine layer
and now they are called as the leptoid
scale
there are two types of leptoid scales
the cycloid scale
and the ctenoid scale the cycloid scale
is found in bony fish it's
round in the and thick in the center and
it has a thinner margin the
scales are arranged overlapping each
other
the lower layer having a connective
tissue
and the upper layer of isopedine
they have pigments that are called as
chromatophores
now this is a fish which has got the
arranged
cycloid scales and as you can see
on the right side the picture of a scale
which have got tiny lines of growth
these lines of growth are for
determining
the age of the fish the closer the lines
the younger the age of the fish or it
was in better conditions
and the further apart the environmental
conditions were not so good for growth

the exposed part of the cycloid scale
has a smooth
edge and the concealed part has a wavy
margin
next one is the ctenoid scale which is
also found in the bony fish
they have their structure and their
shape and the concentric lines
just like the cycloid scales they are
also
found overlapping each other like
cycloid scales
they also have chromatophores
but their anterior and is wavy
or scalloped now the term
ctenoid scale why does this term ctenoid
scale
now ctenoid means tiny combs
these cteni are seen on the free
posterior edge
of the scale a fish which shows ctenoid
scale
is the sillago sihama which is seen
on the picture the next
group are the amphibians if you see a
typical amphibian
you feel that frogs and toads do not
have the presence of scales
yes only some toads do have the presence
of scales
but in one order that is order
apoda they have the presence of
dermal scales which are embedded inside
pockets in the dermis these dermal
scales
which are seen in a like Ichthyophis
uraeotyphlus is the example
that is seen over here in some amphibia
only vestiges
are present of osteoderms
the next group are the reptiles
reptiles have got large dermal scales
like in the turtles and tortoises which
have got
what you call as a shell a typical shell
has got
a dorsal side called as a carapace
and a ventral side it is called as the
plastron
there are also small dermal scales
now the carapace as you can see which is
on the dorsal side
has ribs which have ossified with the
bone
the spine has got expanded ribs
and they are fused with ossification to
these dermal plates
and they form the hard shell
the shell is also covered by skews now
these
scutes are small horny plates made up of
keratin there are some turtles like the

leatherback turtle
now these have lost their skills and
they have reduced
ossification of their shell so much so
that the shell is soft
this is a typical structure of the
carapace
having the costal the plural parts
on the dorsal surface
now the ventral surface of them
as you can see the ventral surface of
a adult tortoise
now in this the plastron it is flat
the flattened part of the shell
structure is the plastron
it is made up of nine bony plates
and towards the sides it has what is
called
as epiplastron epiplastron
is when the clavicle joins
the plastron
scutes are also called
as osteoscutes they are not fused but
they are large and dermal
these scales are found in the turtles
and tortoises
small osteoscutes are found only
in the throat of the crocodile there are
some
Osteoscutes which are found in the scales
of lizards and snakes
now this is a typical wall lizard
and as you can see in the crocodile
around the region
of the neck and the back are present the
scute
the birds the next group it is
does not have dermal scales at all they
are
absent the next group after that the
highest group
is the mammals the mammals
there are only few mammals which have
got the presence
of the dermal structures
but in the armadillo
a typical dermal scale is seen
this is because both the dermal
and the epidermal scales are fused
these fusion leads them to form bands
over their head their shoulders the
waist
and the neck these bony plates
are of a spongy texture
there are some whales which have a bony
osteoderm
on the back as well as on the dorsal
fin then we go to
the dermal fin rays the dermal fin rays
are of three kinds
the lepidotrichia the ceratotrichia
and the actinotrichia

the ceratotrichia the term ceratotrichia
cerato meaning horn tricho meaning hair
these are found in cartilaginous fishes
as you can see it is made up of a horny
hair like
fibrous connective tissue the lepidotrichia
lepidotrichia
lepidotrichia means scale trichia is hair
now the bony fishes whose fins are
supported by
fin rays which are bony and jointed
hence the term lepidotrichia
they are mostly made up of bone
but in some of the extinct forms they
are
having an enamel as well as a
dentine the third type
is the actinotrichia
now at the tip of the lepidotrichia
that is the previous type of fin ray
there are small fibrils these fibrils
are called as the actinotrichia
they are unjointed and they are spines
just like the fin rays now they are
formed
out of collagen so
three types of dermal fin rays the
ceratotrichia
the lepidotrichia and the actinotrichia
these are
some of the books that you can use for
your
further references thank you