Welcome students. Today we will be

doing a session from the subject GEC

110 that is Indian stratigraphy.

This paper is offered at the Semester

Six for the TyBSC students in geology.

In today's module we will be

doing module 3 from Unit 1.

The name of the module is stratigraphy

of Peninsular India:

Dharwar Super Group with its distribution,

lithology, stratigraphic sequence

structures and economics.

This topic will be divided into 2 parts,

so this is going to be part one.

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Through this session we will be

going through the following points.

We will be doing the introduction

that is the Indian Shield cratons

and then onwards we will go into the

Dharwar craton in which

We will do the location, the

Eastern Dharwar craton,

the Western Dharwar craton, the

regional stratigraphy of the Western

Dharwar craton and lithology.

By the end of this session,

the student will be able to

explain the boundaries,

The regional stratigraphic sequence,

and the lithological characteristic

of the Dharwar craton

Introduction.

The Indian Shield is made up of masses of

Precambrian metamorphic terrains which

range in age from 3.6 to 2.6 billion years.

These constitute the continental crust

and is referred to as cratons in general.

The cratons are dominated by

granite and metamorphic rocks.

These imply there was intense

deformation and metamorphism.

Second, it shows occurrences of greenstone-

Gneiss associations and 3rd there often

bordered by shear zone or major fault system.

The intervening fold belt is composed

of metamorphosed deformed Proterozoic

rocks.

Indian Shield cratons: the 4 well

defined cratons that constitute the

Indian Shield are the Dharwar

Craton in the South the Bastar

Craton in central India the Singhbhum

Craton in eastern India and the

Bundelkhand craton in western India.

These cratons are separated from one

another by Proterozoic mobile belts.

The Proterozoic mobile belts have

gone through cycles of deformation,

metamorphism and Granite emplacement.

They are bounded by shear zones

and thrust fault.

In the map you can see the four major

Cratons you have the Narmada-Son

lineament that extend across

the country from East to West.

This separates the Bundelkhand craton

on from the southern Dharwar, the

Singhbhum and the Bastar craton. It is

separated by the Mahanadi Graben and

the Godavari Graben separates the

Bastar craton from the Dharwar craton.

Dharwar craton: the location

Dharwar craton is limited

in the South by the neoproterozoic

Southern Granulite belt,

also called as the Southern granulite

Terrain, or SGT, in the North.

It is flanked by the Deccan Traps,

which is of the Late Cretaceous age

in the northeast by the Karimnagar

granulite belt,

which is 2.6 billion years old.

It occupies the southern flank

of Godavari Graben.

In the East by the Eastern ghat mobile belt.

Which is also of the proterozoic age,

And the boundary between the craton

and the southern granulite terrain

is marked at the Moyar Bhavani shear zone.

In this map of the Dharwar craton,

you can see the Purple lines

which delineate the lineations,

major lineations in the Dharwar craton.

you have the Moyar shear zone

and this is the Bhavani shear zone.

They together joined to form the Moyar-attur

Shear zone. In the South of this shear zone.

you have the Palghat- Kaveri shear zone.

The Moyar- Bhavani shear

Zone is taken as a southern limit

of the Dharwar craton.

The Eastern Dharwar.

Craton and the Western Dharwar

Craton. Swaminathan and

Rama Krishnan in 1981

Divided the Dharwar

Craton into two blocks,

the Western Block and the Eastern Block

These are also referred to as

the Western Dharwar craton

and the Eastern Dharwar craton.

These are separated by the Chitradurga.

Shear zone. In this map you can see

the shear zones that run vertically

across the craton from North to South

you have the Bababudan shear zone.

and you have the Chitradurga

Shear zone. The second one,

the Chitradurga shear zone divides Dharwar

craton into the Eastern Block

and the Western Block.

The Chitradurga shear zone occurs

all along the western margin of the

2.5 billion old closepet granite.

This small batholith marked over hear

extending in the middle of the Dharwar

Craton is the Closepet granite.

The eastern Dharwar

Craton and the western Dharwar Craton.

The greenstone belts of the Western Dharwar.

Craton

are characterized by major sediment

dominated supracrustals with subordinate

volcanism and are recrystallized

In intermediate pressure metamorphism,

on the other hand,

the greenstone belts of the Eastern

Dharwar Craton are often gold bearing

and show low pressure metamorphism.

Geophysical work reveals that

the Western Block has a thicker

crust of 40 to 45 kilometers,

while the Eastern Block has thinner

crust of 35 to 37 kilometers.

This is a regional stratigraphy of

the Western Dharwar Craton after

Swaminathan and Rama Krishnan 1981.

In the in the basement you have

the Gorur gneiss that range in age

from 3.3 to 3.4 billion years.

This is followed by the Sargur group,

which is separated by an intrusive

or tectonic contact.

The Sargur Group is also referred

to as the Ancient Supracrustals

or the older greenstones.

These belong to the age 3.1

to 3.3 billion years.

This is followed by another

intrusive or tectonic contact.

And after this you have the Peninsular

gneisses which is dominantly made up of TTG.

That is tonalite.

Trondhjemite granodiorite suite

After this,

you have the Dharwar Super Group.

So this is the second group of the schists belts,

which is also known as the younger

greenstones or the younger schist belts

This is divided into the Bababudan

Group and the Chitradurga group.

After this you have the granites,

the middle one

This is Closepet granite that range

in age from 2.5 to 2.6 billion years.

After this you have the incipient charnockites

 followed by mafic dykes.

Lithology: in the beginning,

you have the Gorur gneiss, which range

in age from 3.2 to 3.4 billion years.

This occupies the nucleus of the Dharwar.

Craton as stated by Naqvi,

Et. al. in 1974, It is possibly a

part of the earliest sialic component

in the craton. Then is Sargur Group.

These are also referred to as

the Ancient Supracrustals.

These are seen as minor linear

belts and enclaves of basic

to ultrabasic magmatic rocks,

and pelitic siliceous carbonate rich

carbonaceous metasediments. In this map,

You can see the small dark lines.

These are the enclaves or the linear belts

that represent the Sargur schist belts.

Gorur gneiss being ancient of part

of the crust is now completely

engulfed in subsequent igneous

and metamorphic activities.

So it is not as abundantly exposed.

However,

it is exposed in this area marked as Gorur,

which serves as the type area or

the study area for the Gorur gneiss

The Peninsula gneiss: The Dharwar

Craton is a dominant suite of tonalite

Trondhjemite granite diorite that is TTG,

which is collectively referred to

As the Peninsular gneisses. It is a

complex assemblage of granitic rocks,

possibly formed as a result of

more than one process of intrusion,

Migmatisation and granitisation

and perhaps in several phases.

In this map you can see all the empty

spaces which do not have any pattern.

This is the areas where you

see the Peninsular gneisses.

Please note that this area is only marked in

the Dharwar craton on the Deccan Traps,

Cuddapah Basin and Southern

granulite terrain,

although they are marked as white

Spaces, do not form the part

of the Dharwar craton.

so only within the Dharwar craton

All the white spaces marked are where

you see the Peninsular gneisses.

The Greenstones, or the schist belts.

These are mainly voluminous

basalt with subordinate fine

clastic and chemical sediments.

These were laid upon the

basement of Peninsular gneisses..

The volcanics have been metamorphosed

into greenschist, amphibolite and

even higher grade basic granulites,

while the associated sediments have

been recrystallized into quartzites,

crystalline marbles, and metapelites.

In this area,

in this map you can see the shaded parts.

These form the green stones or the

Schist belts of the Dharwar craton.

We will learn more about this Dharwar.

Super Group in the next module.

These are the references that

were used for this module.

Thank you for listening.