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# Tectonics and Structural Geology: Indian Context

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Soumyajit Mukherjee  
Editor

# Tectonics and Structural Geology: Indian Context

 Springer

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*...geology contents in geological text books for compulsory education is not regularly updated, so new paradigms are included belatedly (as happened, e.g., with plate tectonics), and this is one of the reasons why younger students lag behind in Geosciences.*  
—Brusi et al. (2016)

*Brusi D, Calonge A, Souza E (2016)  
Textbooks: A tool to support geosciences learning. In: Vasconcelos C (ed) Geoscience education: Indoor and outdoor. Springer, pp 173–206. ISBN: 978-3-319-43318-0.*

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# Introduction to Tectonics and Structural Geology: Indian Context



Soumyajit Mukherjee

## 1 Summary of Different Chapters

Tectonics and structural geology of Indian terrain is of great interest to the Government and a number of private exploration agencies that are working presently. This edited volume aims to meet this requirement. In addition, B.Sc. and M. Sc. geoscience students undergoing geohistory and/or tectonic courses would benefit using this book.

This edited volume brings 16 research papers (Chaps. 2–17) from both academia and industry.

Mukherjee et al. (2019) in Chap. 2 present an exhaustive review on the geology and the geochronology and of the Chotanagpur Granite Gneissic Complex (CGGC). They classify the CGGC into three domains, and also comment on the India-Antarctica reconstruction.

Padmalal et al. (2019) in Chap. 3 perform morphologic dating of the seismogenic Allah Bund Fault scarp as 208, 200, and 193 yrs B.P. These dates establish reliably that those scarps were produced by the 1819 earthquake.

Patil Pillai and Kale (2019) in Chap. 4 detail the sedimentation and the tectonic histories of the Kaladgi Purana (Proterozoic) basin. The basin in the first stage underwent sagging. A nested continental sag basin formed afterward.

Babar et al. (2019) in Chap. 5 describe with several field photographs the deformation features near the basement granites around Degloor (Maharashtra). They work out the stress regime and the stress axes orientations. One can compare these findings with the Deccan tectonics as well by going through Misra et al. (2014, 2015), Misra and Mukherjee (2015, 2017), etc.

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1

In their very detailed review on the Bengal basin, Hossain et al. (2019) in Chap. 6 present the basic division of this basin, fault distribution, and how these divisions evolved temporally with or without volcanism.

Goswami and Upadhyay (2019) in Chap. 7 study the structural geology and geochemistry of the Kadiri schist belt (Cuddapah) and decipher an ocean-continent subduction tectonics and a volcanic arc setting of the terrain.

Detailed field investigation of the structural geology of the Nallamalai Fold Belt (Cuddapah) by Tripathy et al. (2019) in Chap. 8 reveals a Pan-African thin-skinned tectonics, which link with the tectonics of the East Gondwana fragments.

Multi disciplinary geoscientific studies by Mazumder et al. (2019) in Chap. 9 reveal that a number of E trending steeply dipping shear zones pass through the northern part of the Cauvery Basin that was later reactivated.

Dasgupta (2019) in Chap. 10 reviews the Cauvery basin's tectonics. Half grabens in its all the three sub basins signify a rift origin of the basin. This article analyzes the transfer zone geometries from the Cauvery basin that are crucial in developing hydrocarbon trap conditions.

Misra et al. (2019) in Chap. 11 study the field structural geology of the Ramgarh impact structure (SE Rajasthan), and especially its fracture patterns. They conclude that impacting happened at the palaeo-channel of the river Parvati.

Dinkar et al. (2019) in Chap. 12 describe in detail field structural geology from the Lalitpur district (Uttar Pradesh). The notable information are E/ENE trending axial traces and Proterozoic to Neoproterozoic reactivation plausible in the southern part of the study area.

Singh and Awasthi (2019) in Chap. 13 discuss the tectonics of the Kangra region (Himachal Pradesh), which is presumably devoid of any weak layer below itself. Overpressure condition at depth possibly due to fluid activity had helped to propagate this crustal wedge towards the foreland side.

Kumar et al. (2019a) in Chap. 14 describe from the field along with attractive photographs the damage zone associated with the Munsiri Thrust, a strand of the Main Central Thrust, from the Mandakini river section, Higher Himalaya. The authors document more landslides from the damage zone and perform engineering geological studies from such zones.

Mahato et al. (2019) in Chap. 15 perform detailed field studies from the Mussoorie syncline and the nearby regions from the Uttarakhand Lesser Himalaya. Top-to-N/NE back shear and Himalayan arc-parallel shears (such as top-to-NW) are the new meso scale findings in this work.

Banerjee et al. (2019) in Chap. 16 too document orogen-parallel shear from the Darjeeling Group of rocks from the Sikkim Lesser Himalaya. A more detail work from the same research group has been submitted in a journal where such deformation is reported from the Siwalik Himalaya (Dutta et al. submitted).

Kumar et al. (2019b) in Chap. 17 discuss the database of lead (Pb) content in the Indian Gondwana coal ( $^{207}\text{Pb}/^{206}\text{Pb} = 0.7150\text{--}0.8845$ ;  $^{208}\text{Pb}/^{206}\text{Pb} = 1.9484\text{--}2.2231$ ; Pb concentration =  $3.2\text{--}566\text{ mg kg}^{-1}$ ). This study will have a far-reaching implication in India-Antarctica plate reconstruction.

Readers without any instructors, especially students (in some unfortunate cases), are requested to go through few recent books on structural geological and tectonic principles and Indian case studies (e.g., Sharma 2010; Mukherjee 2013a, b, 2014, 2015a, b; Mukherjee et al. 2017; Mukherjee and Mulchrone 2015; Mukherjee et al. 2015, 2017; Valdiya 2016; Bose and Mukherjee 2017; Dasgupta and Mukherjee 2017; Chetty 2018; Misra and Mukherjee 2018; Roy and Purohit 2018; Acharyya, in press) before going through this book.

Refer this book as follows:

- Mukherjee S (2019) *Tectonics and Structural Geology: Indian Context*. Springer International Publishing AG, Cham. ISBN 978-3-319-99340-9. pp. 1–455.

Refer individual chapters of this book as follows:

- Banerjee S, Bose N, Mukherjee S (2019) Field structural geological studies around Kurseong, Darjeeling-Sikkim Himalaya, India. In: Mukherjee S (ed) *Tectonics and Structural Geology: Indian context*. Springer International Publishing AG, Cham. ISBN 978-3-319-99340-9. pp. 425–440.

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