International Journal of Advance and Applied Research
www.ijaar.co.in
ISSN – 2347-7075 Impact Factor – 7.328
Peer Reviewed Bi-Monthly
Vol.9 No.5 May – June 2022

SEQUENCE OF LAVA FLOWS IN VAMBORI DONGARGAN GHAT SECTION IN AHAMADNAGAR DISTRICT

Dr. Prashant.U. Terker
Assist. Prof. & HOD Dept. of Geology. Kohinoor Arts, Commerce, Science College
Khultabad, Dist Aurangabad
Corresponding Author - Dr. Prashant.U. Terker
Email- *prashantterker@gmail.com*

Abstract-
The basaltic lava pile of vambori-dongargan ghat section is comprised of lava flows between 613M and 719.5M elevations above msl respectively. Majority of lava flows are compact porphyritic basalt flows ranging from thickness 2.75M to 27.00M. Plagioclase phenocrysts are visible to naked eyes. Olivine is altered to iddingsite is also seen. Out of twelve lava flows nine flows are of compact porphyritic basalt two flows are of compact aphanitic basalt and one flow is of amygdaloidal basalt.

Introduction

The deccan basalt in western india represents one of the most remarkable volcanic provinces of earth. This volcanic province occupies about 500000KM^2 covering most of the parts of maharashtra, gujarat, and madhya pradesh(krishnan 1982) several research groups have studied deccan basalts over the entire length of western ghats (mahoney et.al. 1982; cox and hawkesworth1984;1985; beane et.al. 1986; devey and lightfoot1986; devey and cox1987; lightfoot and hawkesworth 1988; bodseet.al. 1988; kadriet.al.1988, subbarao et.al. 1988;1994)these investigations are essentially restricted to few areas , therefore, study of critically located ghat section of ahamadnagar district has been taken up. Due to its proximity to nasik, which is considered to be the centre of large shield volcano (beane et.al. 1986) and secondly it constitutes link in between western part of marathwada region of deccan volcanic province. Stratigraphic correlation of the lava pile is crucial to understand the extent of volcanic eruption and the edifice of shield volcano. Vambori-dongargan ghat section is exposed on ahamadnagar-shendi-dongargan-vambori road. It is 21.500 km away from township of ahamadnagar. The ghat section is located towards north of ahamadnagar township. The ghat section starts from vambori village river bridge which is at base (ch.21.500) msl 613M to dongargan village at top msl 719.5M (ch.19.00) and has length of 2.5KM. The basalt flows are simple type and are ranging in thickness from 2.82M to 27.00M. Majority of the flows are compact porphyritic in nature with varying degrees with phenocrysts of plagioclase, sometimes of augite and rarely olivine set in groundmass of plagioclase, clinopyroxene, opaque and glass.

Location/study area: to carry out the systematic detailed study of the lava flows exposed in vambori dongargan ghat section the flow boundaries of the lava flows were demarcated. The flows are exposed in vambori-dongargan are from msl 613M to msl 719.50M. The ghat section is exposed on ahamadnagar-shendi-dongargan-vambori road at a distance of 21.500KM from ahamadnagar town towards north of ahamadnagar and has length of 2.5KM. The ghat section comprises succession of basaltic lava flows exposed from village vambori (at river) which is at the base of ghat section and dongargan village at the top of the ghat section. In this ghat section there are twelve lava flows exposed.

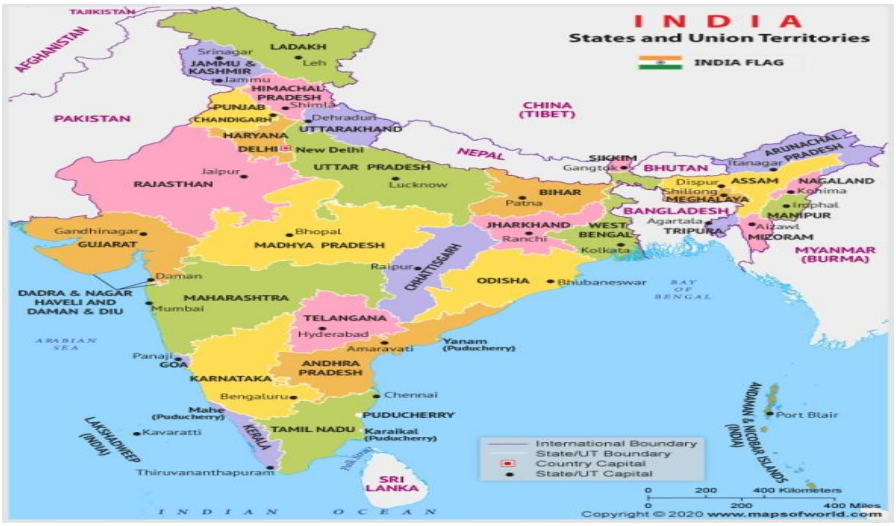

Fig 1:-map of india

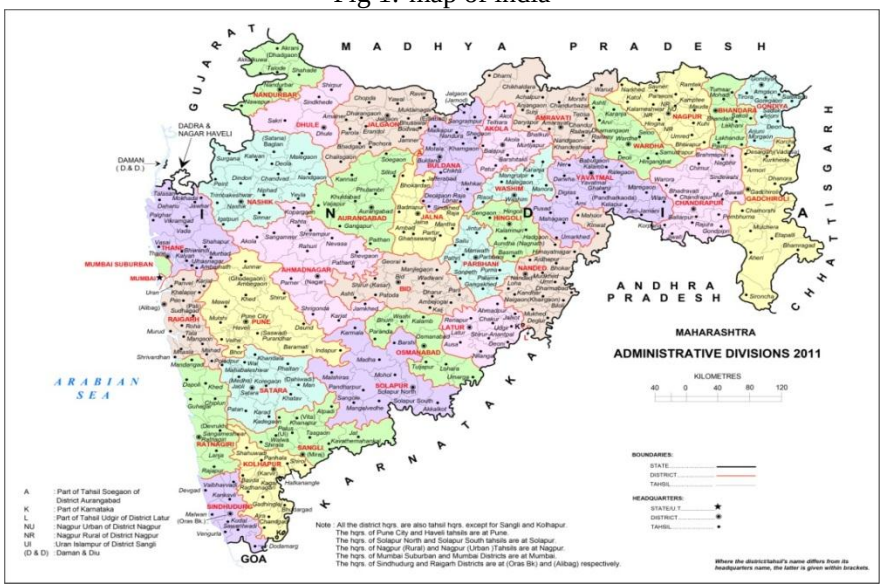

Fig 2:- map of maharashtra

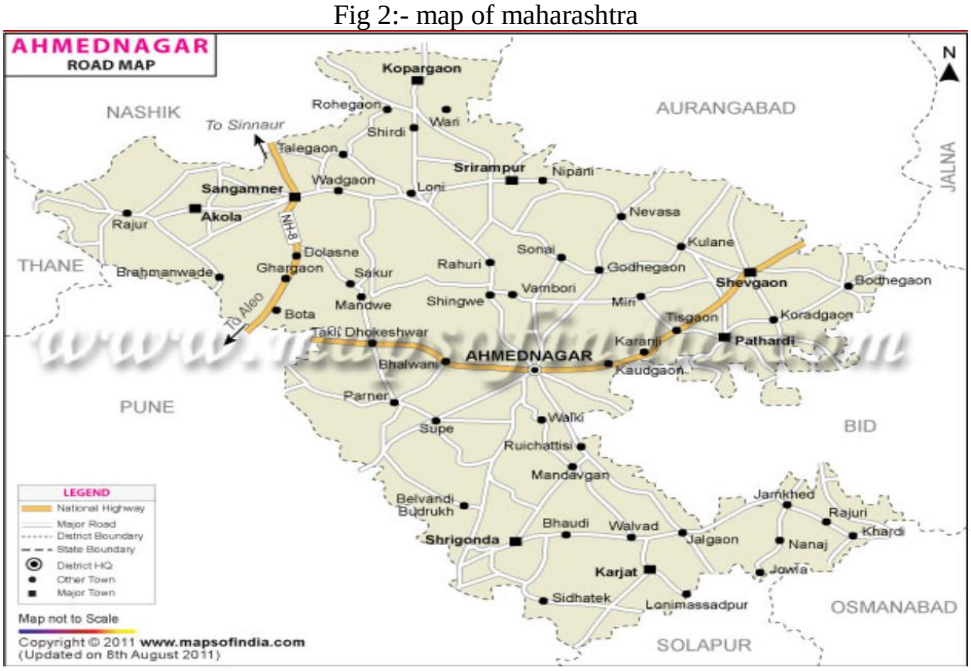

Fig 3:- location of vambori study area

Methodology

Field investigations were carried out with the help of ghat traverses and the basalt flows were marked in ascending order. Fresh samples were collected from the flows. All the flows have horizontal surface and majority of the basalt flows are porphyritic and very few flows are aphanitic. The porphyritic basalt flows have plagioclase phenocryst of large size and are visible to naked eyes. The top portion of the flows is amygdales filled with secondary minerals like calcite, zeolite, chlorpheite etc. Spheroidal weathering of some compact aphanitic basalt flows is also seen. Entire ghat section is devoid of tachylytic basalt flow and dyke. The summary of the salient features of vambori-dongargan ghat section is given below in table no.1

Table no. 1

Vambori-dongargan ghat section	Description
Thickness of lava pile	106.500M
Minimum elevation above msl	613.000M
Maximum elevation above msl	719.500M
No. Of flows	12
Minimum thickness of lava flows	2.75M
Maximum thickness of lava flows	27.13M
No. Of amygdaloidal basalt flows	1
No.of compact porphyritic basalt flows	9
No.of compact aphanitic basalt flows	2

Flow type, thickness and their percentage in vambori-dongargan ghat section is given below in table no.2

Table no. 2

Flow type	No of flows	Maximum thickness of flow	Minimum thickness of flow	Average thickness of flow	Flow % in ghat section
Compact porphyritic basalt	9	27.13M	2.75M	9.83M	83%
Compact aphanitic basalt	2	8.30M	7.00M	7.82M	14.36%
Amygdaloidal basalt	1	2.82M	2.82M	2.82M	2.64%

Description of lava flows

Flow no.1:- this flow is compact porphyritic basalt flow with medium sized phenocryst of plagioclase. These plagioclase phenocrysts are turbid white in colour. The thickness of this flow is 27.13M.

Flow no.2:-this is compact porphyritic basalt flow having lath shaped plagioclase phenocryst with length of 7CM. To 8 cm. Its middle portion shows spheroidal weathering. The thickness of this flow is 4.00M.

Flow no.3:- this is compact porphyritic basalt flow with small to medium sized plagioclase phenocryst. The thickness of this flow is 8.42M.

Flow no.4:- this is compact porphyritic basalt flow having thickness of 7.32M.

Flow no.5:- this is compact porphyritic basalt flow having thickness of 8.25M. The plagioclase phenocrysts are of small to medium size.

Flow no.6:- this is compact porphyritic basalt flow having white coloured plagioclase phenocryst with white lustre embedded in glassy matrix. The thickness of this flow is 17.38M.

Flow no.7:- this is compact porphyritic basalt flow with small to medium sized plagioclase phenocryst. The thickness of this flow is 3.28M.

Flow no.8:- this is amygdaloidal basalt flow having thickness of 2.13M. The amygdales are filled with silica and zeolites.

Flow no.9:-this is compact porphyritic basalt flow. The plagioclase phenocryst has length of 6CM.and exhibit vitreous lustre. The thickness of this flow is 2.75M.

Flow no.10:- this is compact aphanitic basalt flow having thickness of 7.00M.

Flow no.11:- this is compact aphanitic basalt flow having thickness of 8.30M.

Flow no.12:-this is compact porphyritic basalt flow. Lath shaped plagioclase phenocrysts are visible to naked eyes having length up to 8 cm. The flow has thickness of 10.00M

Summary and conclusion

1. It is observed that compact porphyritic basalt flows are predominating in this ghat section indicating that fissure type of eruption seems to have been prevalent occurring above msl 600M and this is in agreement with central part of deccan trap. (kulkarni 1984)
2. The predominance of lath shaped plagioclase phenocryst in vambori – dongargan ghat section is an indication of

slow rate of cooling of lava and also indicates the accumulation of plagioclase phenocryst by floatation in highly differentiated magma that concentrated near the roofs of magma chamber at shallow depth which is in agreement with r.k.sharma and sudha vaddadi (1991)

3. The absence of red tachylyte is in agreement with the conclusion drawn by kulkarni (1975) that the lava flows came in quick succession without intertrappean intervals.
4. The field characters of basalt flows have clean basalt to basalt contact at many places which confirms the view that the lava flows came in quick succession and there were no intertrappean intervals as concluded by p.s. Kulkarni (1984)

References

1. Agashe, i.v. And gupte, r.b. (1968) some significant features of deccan trap. Mem. Geol. Soc. Indian no.2 pp.309-319.
2. Beane, j.e., turner, c.a., hooper p.r., subbarao, k.v. And walsh, j.n. (1986) stratigraphy, composition and form of deccan trap basalts, western ghats indian. Bull. Volcanal. V.48, pp.61-83
3. Choube v.d. (1973) long distance correlation of deccan trap basalt flows central india. Bull. Geol. Soc. Amer. V.84 pp.2785-2790.
4. Deshmukh s.s. (1988) petrographic variations in compound flows of deccan traps and their significance. Geol. Soc. India mem.10 pp.305-320.
5. Doke s.d. (july 2013) study of deccan trap flows in chikhaldara ghat section (dist. Amravati) ph.d. Thesis dr.b.a.m. University.
6. Hooper, p.r. Subbarao, k.v. And beane, j.e. (1988). The giant plagioclase basalts (gpbs) of the western ghats, deccan trap, geological soc. India mem. 10 pp.135-144.
7. Karmarkar, b.m. (1978), deccan trap basalt flows in borghat section of central railway. Journ. Geo. Soc. India v.19,1978 pp.106-114.
8. Khadri, s.f.r. Subbarao, k.v. Hooper, p.r. And walsh, j.n. (1988) stratigraphy of thakurwadi formation, western deccan basalt province, india.
9. Kulkarni p.s. (1984) study of deccan trap basalt flows in aurangabad district ph.d. Thesis dr.b.a.m.university.
10. Sable a.b., vishwakarma l.l. (1996) zeolites and associated secondary mineral in deccan trap volkanics : their distribution; genesis and economic importance gondwana geo magzine sp. Vol.2 pp.511-518.
11. Tejankar a.v. (2002) study of deccan trap flows in toranmal ghat section of deccan volcanics ph.d. Thesis dr.b.a.m. University