அரண்

பன்னாட்டுத் தமிழாய்வு மின்னிதழ்

காலாண்டு இதழ்
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மராத்திய நடன மங்கை (தோல் பாவை)

தொல்லியல்

Neolithic Grooves found at Keezanur, Javadi hills of Tamil Nadu

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Abstract

The Neolithic period was originally occurrence of polished stone tools and pottery. The rerm Neolithic came to be used to describe the technological progress of man in the areas of manufacturing polished stone tools and pottery. The recent archaeological exploration carried out in the Vellore region particularly at the Javdi hills found 21 grooves for sharpening Neolithic polished stone axe. The present paper discusses the recent discovery of the 21 grooves and an overview of the Neolithic culture in Tamil Nadu.

Key Words: Grooves, Neolithic, Archaeology, Keezanur, Tamil Nadu

The hamlet Keezanur lies on the Javadi hills, an off-shoot of Eastern Ghats, 5 km north of Pudurnadu in Tiruppattur taluk of Vellore District. The major village Pudurnadu lies 21 km east of Thanneerpandal which lies on Tituppattur-Chengam main road at the distance of 7 km south of Tiruppattur. A small rivulet originated out of spring flows on the western side of the village **(Figure 1)**. Nearly 21 grooves used for polishing the edges of the Neolithic tools are noticed on the bedrock located in the midst of this rivulet on the western side of the village. These grooves were locally known as *kuuzieruthu paarai* **(Figure 2)**. According to the tradition, the grooves are formed due to the pressure of the toe of the cattle which use to come here for drinking water **(Figure 3).** These are shallow troughs used for polishing the working edges of the Polished Stone Axe during Neolithic times. Such shallow grooves were reported earlier at Sangnakallu-Kupagal in Bellary district of Karnataka. There is hardly any Neolithic tools that are found in different stages of manufacture like chiselling, pecking, grounding and polishing. However, more than 75 several polished stone axes kept under the boulder for worship close to the Ganesha temple (*Pillaiyar koil*) located about a km east of the village were noticed **(Figure 4)**. According to the villagers, these tools were collected from the cultivated field in the vicinity of the shallow troughs/grooves stated above. The available evidences suggest these grooves were formed while sharpening/polishing the edges of Neolithic celts **(Figure 8)**. The Neolithic tools might have manufactured at some other site and were brought here as finished goods. These finished polished stone axes might have placed under constant use by the cultivators which resulted with blunted working edges. These blunted working edges might have sharpened by grinding them in these shallow trough shaped grooves and to make the tools as re-usable ones.

Shallow troughs or grinding grooves

A Brief history or background on the studies related to Shallow troughs or grinding grooves

The systematic study on Neolithic stone tools was first initiated by Robert Bruce Foote by studying the lithic assemblages collected at Neolithic sites of Bellary District, Karnataka state (Foote 1916). On the basis of his study, he developed a typology of stone artefacts that included celts, corn-crushers, chisels (ranging in size), worked scrapers, cores, core -flakes, chisels, and also identified the source of raw material as dolerite dykes, that traversed some of

the granite hills of the region. On the basis of the dolerite artifacts and flakes which he recovered, Foote was able to outline four stages of celt fabrication namely chipping, pecking, grinding and polishing. He suggested that knapping was carried out by means of stone hammer in the first stage, pecking by means of sharp pointed striker leading to the third stage of achieving a sharp and even cutting edge by grinding and then polishing. The last two stages were executed by rubbing the pecked stones back and forth on the granite boulders which consequently developed into shallow troughs called grinding grooves. Later on many scholars have worked on the Polished Stone Axes of Neolithic Period from different parts of India and they have also noticed similar process involved in manufacturing of Polished Stone Axes. In recent times, a detail analysis on Polished Stone Axe was carried out by Adma Brum *et. al.* (Adma Brumm *et. al.* 2007). According to them, three separate methods were employed for making Polished Stone Axes namely Method 1, Method 2, and Method 3 depends upon the nature of raw material.

1. Method 1 ("block-based") involved the reduction of large unmodified blocks of dolerite into bifacially flaked axe blanks; and the process involved in bringing the axe into final stage involved 4 stages namely Stage 1- Raw material procurement, Satge 2 - Early Reduction or "edging" of raw stone blocks into large bifacial "rough-outs", Stage 3a - Bifacial thinning and contouring, Stage 3b - Bifacial trimming and shaping and in final Stage 4 - Pecking and/or grinding

2. Method 2 ("slab-based") involved the reduction of relatively thin flat slabs and tabular pieces of dolerite into bifacially flaked axe blanks; and the process involved in bringing the axe into final stage involved 3 stages namely Stage 1- Raw material procurement, Stage 2 - Bifacial reduction and Stage 3 - Pecking and/or grinding

3. Method 3 ("flake-based") involved the reduction of amorphous flakes and non-flake debitage into both unifacially and bifacially retouched axe blanks. The process involved in bringing the axe into final stage involved 3 stages namely Stage 1- Raw material procurement, Stage 2 - Bifacial or unifacial retouch and Stage 3 - Pecking and/or grinding .

These methods of production are arrived based on their observation made on tools collected from the study area. Based on the material culture and absolute dating obtained from this Sangnakallu-Kupagal Complex site, Adam Brumm et. al., have concluded that the production of Polished Stone axe increased in numbers enormously during the Late Neolithic to Megalithic period (1400-1200 BCE) at this site. In and around this Sangnakallu-Kupagal Complex site, many burials dating back to Megalithic Period were noticed.

Shape of the grinding grooves

The site Keezanur has yielded trough shaped grinding grooves, biggest one measured 40 cm in length and 8 cm in width with the depth of 3 cm, whereas, the smallest one measured 14 cm in length and 7 cm in width with depth of 1 cm. However, there is a groove which measured 5 cm in width and is the narrowest amongst all other grinding grooves. When width is taken in account, majority of grinding grooves group themselves in the 7-8 cm range and when depth is considered, most of them fall under 2-3 cm group. All of these grinding grooves have a shallow trough shape. In cross section, these grinding grooves are in “V” or “U” shape.

Formation and metrical analysis of grinding grooves

As it is clear from the studies done by earlier scholars from other parts of South India, these shallow troughs or grinding grooves were used to polishing/sharpening the working edges

of the stone axes. In this process, the axe would have then been rubbed back and forth on a plane surface with the aid of sand slurry and water to sharpen and polish the surface of the axe, which in turn created a smooth surface on the rock which was used to polish. The evidence at this site show that, all grinding grooves when viewed in cross section looks “U” or “V” shaped. The explanation for this “U” and “V” shaped cross section would have been the result of preference of knappers in selecting a part of stone axe in order to start the polishing procedure. The knapper would have started polishing the tip end first and then might have polished the whole surface of the stone axe in the successive stages. This phenomenon of tip of the stone axe being polished first and then in successive stages the whole body of the stone axe being polished can be supported with the fact that all the grinding grooves are “U” or “V” shaped in cross section, so when a knapper desire and starts to polish the tip of stone axe, he has to hold the axe in such a way that the thrust exerted by the kanpper will abrade the rock surface deeper in the middle and this in turn will create a shallow trough shaped feature with deepest depth in the middle. This “U” or “V” shape was the result of polishing of stone axe for quite some time and this is the result of polishing of many stone axes. In the initial stage the grinding groove might have been a elongated smooth surface with sight depression on the rock face and as times passed, more and more stone axes are polished and the cross section of the grinding grooves changed into “U” shape and then in the final stage to “V” shape.

Sl.No	Grooves No.	Length in cms	Width in cms	Depth in cms	Orientation
1	1	17.5	6	2	NW and SE oriented (Broken)
2	2	15	6.5	1.5	East West oriented (Broken)
3	3	33	7.5	2.3	East West oriented
4	4	40	8	2.5	East West oriented
5	5	27	6.5	1.4	NE and SW oriented
6	6	34	7.5	2.2	NW and SE oriented
7	7	25	7.5	1.7	NW and SE oriented
8	8	30	5	0.8	NW and SE oriented
9	9	34.5	5.5	2.5	East West oriented
10	10	37	7	2.2	East West oriented
11	11	36.5	7	2.5	East West oriented
12	12	33.5	7.5	3	NW and SE oriented
13	13	28	7	1.8	NW and SE oriented
14	14	31.5	7	2	NW and SE oriented
15	15	34	8	2.5	NW and SE oriented
16	16	32	8	2	North and South oriented (Broken)
17	17	14	6.5	1	North and South oriented (Broken)
18	18	29	7	1.8	North and South oriented (Broken)
19	19	32	8	2.6	North and South oriented
20	20	37	7	2.5	NW and SE oriented

21	21	28	5	1.2	NW and SE oriented

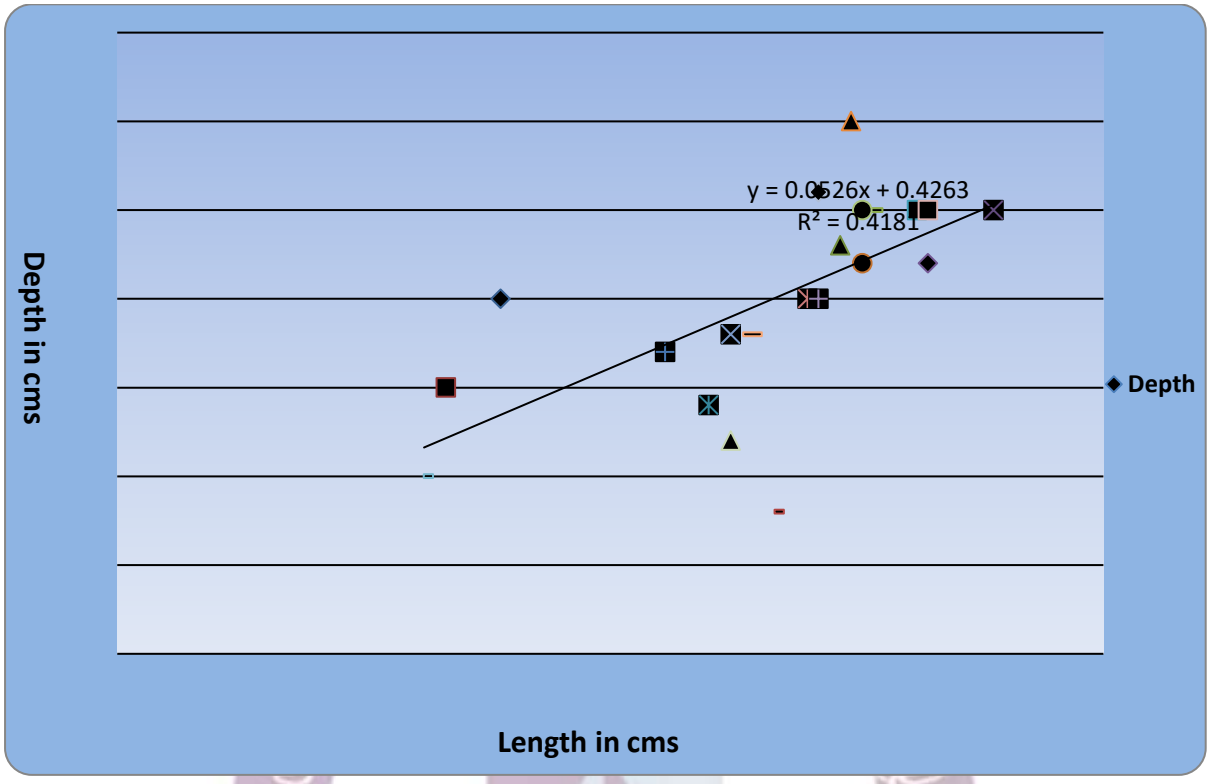

Figure 5. Showing the grooves Length and Depth

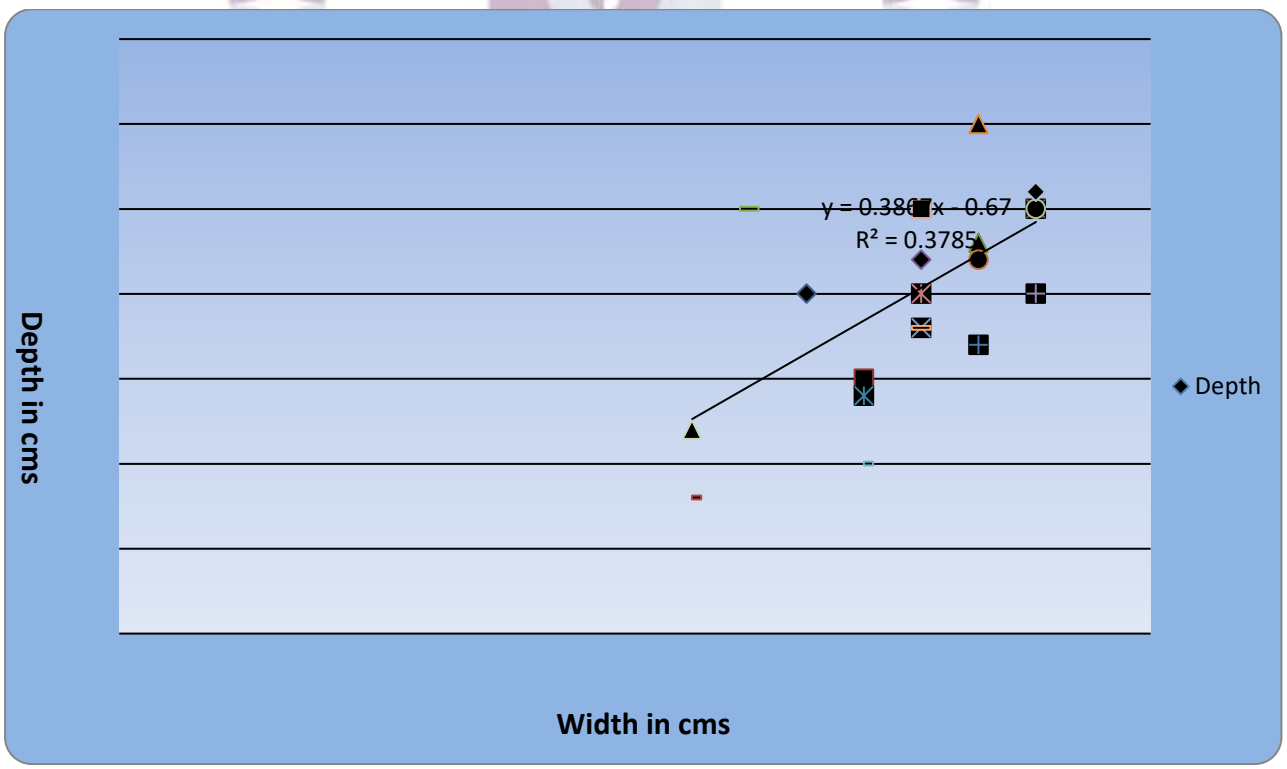

Figure 6 Showing the grooves Depth and Length

Figure 5 and 6 shows a grphicala representation of the comparsion made between length, width and depth of grinding grooves found at this site. This comparison shows a positive relation between length, width and depth. Figure 5 indicates that as length increases depth also increase,

this inturn indicates that as more and more axes were polished length and depth of the grinding grooves increased. Similarly, Figure 6 also indicates as the width increased the depth also increased. This indicted that as more and more axes were polished the width increased with the increase in depth.

So both the figure indicates that as more and more axes were polished the length and width of the grinding grooves increased and at the same time the grinding grooves became more depper.

Dating the shallow troughs or grinding grooves

As noted above, these shallow trough or grinding grooves were reported earlier in Bellary region of Karnataka state and are dated to as early as Neolithic period. The studies by Adam Brum *et. al.* at Sangnakallu-Kupagal site have indicated that during the transition phase between Late Neolithic to Megalithic period the axe manufacturing became a major industry and they have also hypothesised that the axes manufactured at this site was probably traded to other parts of South India. In light of the emerging facts from Sanganakallu–Kupagal Complex, on a relative basis we can date Keezhanur site to Neolithic period. However, further investigation is required to locate Neolithic settlements in the vicinity.

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Illustrations – Plates

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2. **Ramesh, R, Fig. 2. Ancient grooves on the bed rock used for sharpening the Polished Stone Axes of Neolithic times found at Keezanur.**
3. **Ramesh, R, Fig. 3. Polished Stone Axes kept as *sami-kal* (God stone) for worship close to the Ganesha temple (*Pillaiyar koil*) found at Keezanur.**
4. **Ramesh, R, Fig. 4. Ancient grooves on the bed rock used for sharpening the Polished Stone Axes of Neolithic times near the pond found at Keezanur.**

5. **Ramesh, R, Fig. 5. Showing the grooves Length and Depth**

6. **Ramesh, R, Fig. 6. Showing the grooves Depth and Length**

7. **Ramesh, R, Fig. 7. Line Drawing of the ancient grooves on the bed rock used for sharpening the Polished Stone Axes of Neolithic times.**

8. **Ramesh, R, Fig. 8. Polished Stone Axes found at Keeznur.**

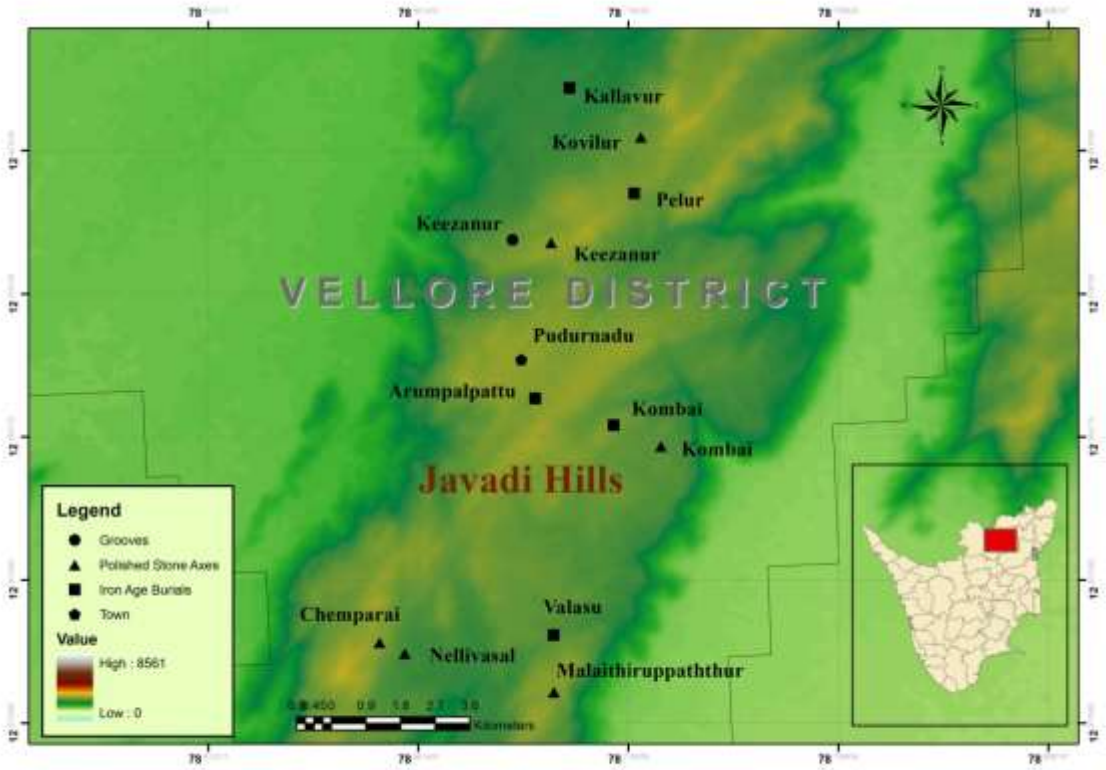

Fig. 1. Archaeological Sites in Javadi Hills

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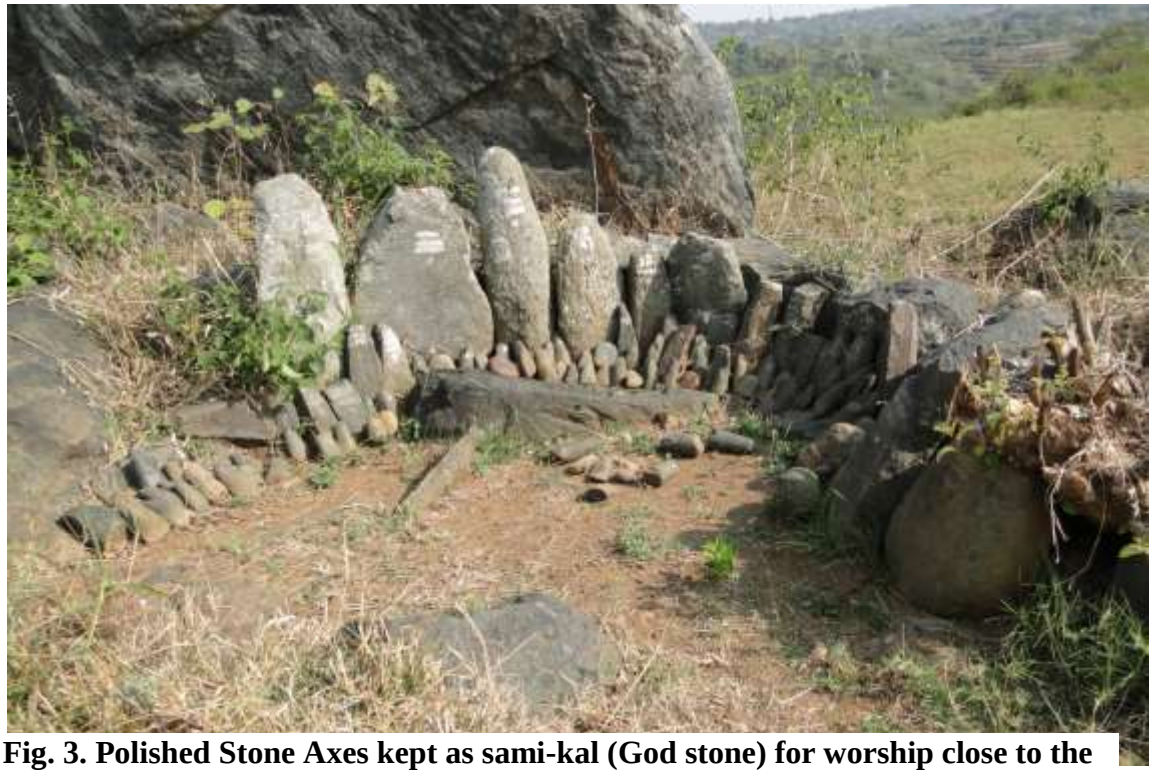

Fig. 3. Polished Stone Axes kept as sami-kal (God stone) for worship close to the Ganesha temple (Pillaiyar koil) found at Keezanur

Fig. 4. Ancient grooves on the bed rock used for sharpening the Polished Stone Axes of Neolithic times near the pond found at Keezanur

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