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Suggested two-fold Groupings of Main Lines D, C, B, A Terminations and Locations of axial Triradius

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Various palmar dermatoglyphic traits — including configurations, obliquity of main lines or ridge alignments and locations of axial triradius — have been investigated but little from the inheritance standpoint. However, few studies done so far are either actually inconclusive or suggest a clearly complex mode of inheritance for the dermatoglyphic traits (mostly polygenic). Some of important papers worth mentioning are by Csik and Malan (1937: 186-205), Lemme (1953: 312-337), Meyer-Cording (1955: 147-186), Meyer-Heydenhagen (1935: 1-42), Penrose (1949: 412-416; 1954: 10-38), Pons (1954: 35-50; 1959: 252-256; 1960: 5-16), Schaeuble (n. d.: 1959: 183), Weinand (1937: 418-442), Weninger (1935: 182-193; 1947: 55). and so on. Schaeuble (159-183) and Wilde (1953: 1-120) offer uptodate references pertaining to inheritance of dermatoglyphic characters and may be consulted for a complete list. Pons (1954: 49) suggested " polymerie with genes of additive effect " in connexion with the inheritance of obliquity of palmar ridge alignments as adjudged on the basis of main lines while Bansal & Rife's recent study dealing with the inheritance of accessory triradii on palmar interdigital areas II and IV suggests that " a single dominant gene, with approximately 88% penetrance, is responsible for D patterns in both the second and fourth interdigital areas " (Bansal and Rife 1962:29-38). In accordance with the latter approach that is ideally suited for such investigations (Cummins 1962 and 1963; pers. comms.) and also in the light of Pons' reflections upon the importance of the genetical studies in dermatoglyphics (Pons 1956: 129), the author has recently suggested the following main line groupings as based on an earlier unpublished study (Sharma 1962: 112-159):

Line D

(I) More transverse grouping (Symbol: T) includes conditions D_9 to D_{13}, i. e., Cummins' Modal groupings or types 9 and 11 of line D (Cummins and Midlo 1961: 113).

(II) Less transverse grouping (Symbol: t) includes the rest of line D terminations 5, 7, 8 and condition X.

Ricevuto il 6. VIII. 1963

Line C

(I) More transverse grouping (T) includes conditions C_5, C_6, C_{10} and C_{11}.

(II) Less transverse grouping (t) includes abortive conditions X or x and absence of triradius c and so of line C.

Line B

(I) More transverse grouping (T) includes conditions B_5 and B_6.

(II) Less transverse grouping (t) includes conditions B_3, B_4, B_7, B_8 and B_9.

Line A

(I) More transverse grouping (T) includes A_5, , $A_{5,,}$, A_6 and A_7 or Cummins' Modal grouping 5 of line A (Cummins and Midlo 1961: 113).

(II) Less transverse grouping (t) includes conditions A_1 to A_4 or Cummins' Modal groupings 1 and 3 of line A (Cummins and Midlo 1961: 113).

These groupings are being personally communicated to the interested workers in response to personal communications (Kumbnani 1962a, 1962b, 1962c, 1962d; Sardool Singh 1963a, 1963b) and through the medium of this journal to all interested in the field. Kumbnani (1962) has already applied these groupings on each of the four lines D, C, B, A to test the hypothesis of "*a single dominant gene*" (Bansal and Rife 1962: 29-38) with the object of calculating the degree of complete penetrance (Material: 100 biological families belonging to various Brahman and Kshatriya castes drawn from Sind, W. Punjab and N.W.F.P., now settled in Delhi and around) and has found out that a single dominant gene with approximately 99% penetrance and another gene with aproximately 88% penetrance are responsible for the transversality of lines D and A respectively (followed by B and C). This is an interesting point in view of Leche's earlier observation: "... D line is by far the most important, line A next in importance, while lines B and C are of less significance..." (Leche 1933: 15). This has also been confirmed recently by the author elsewhere but in a different manner (Sharma 1962: 77-159). It has been opined that "Cummins' MLI (1936) is simply instrumental in expressing this significant relationship between the two lines" (Sharma 1962: 150). In this context, Newman's opinion that "... use of the main-line index is statistically suspect, yet it does have *definite meaning*" is understandable (Newman 1960: 50).

Similarly, the problem of understanding the mode of inheritance of proximo-distal anatomical location of axial triradius may similarly be solved if Sharma's proposed metric modification (Sharma 1961: E 111; Sharma 1962*a*: in the press) leading to *t-Index* (Sharma 1962: 48-49; Sharma 1963 *f*: in the press) is made use of

alongwith the groupings being suggested in the present paper. The metric modification of the existing qualitative approach (Cummins and Midlo 1961: 99-100) consists of dividing the median-longitudinal axis of the palmar print lying between the *distalmost wrist crease* (DWC) and the *proximalmost metacarpo-phalangel crease* (PMPC), located at the level of axial triradius under investigation, into six equal parts with the help of a transparent ruler; the most proximal triradius determines the location of this axis in case two or more than two axial triradii occur. The first, second and third segments indicate t, t' and t'' respectively (Sharma 1962: 42-49), those lying in the fourth segment being labelled as t''' (Biswas 1962: pers. conf. vide Sharma 1962: 385); *on-the-line* or marginal positions are adjudged in favour of the next distal segment. The suggested two-fold grouping postulates lumping of (i) *t'' and t'''* (indicative of lower, i. e., more distal or central positions compared to *t and t'*), and (ii) *t and t'* (indicative of higher or more proximal positions relative to *t'' and t'''*); the symbols assigned are (i) L and (ii) l respectively.

Summary

Using Bansal & Rife's recent study (1962) as a working model, certain two-fold groupings of four palmar main lines and the axial triradii positioning have been proposed on the basis of the writer's unpublished work (1962). Some fairly encouraging penetrance figures suggest to apply the same groupings on twin data, on largest and richer family material drawn from the same Mendelian population, and to use other available methods of penetrance calculus, including one from concordance figures that is under investigation by the author.

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RIASSUNTO

Sulla base del recente lavoro di Bansal e Rife (1962) sono stati proposti alcuni raggruppamenti doppi delle quattro linee palmari principali e della posizione dei triradii assiali. Alcuni incoraggianti valori di penetranza suggeriscono di usare gli stessi raggruppamenti su campioni gemellari, su famiglie più ampie, estratte dalla stessa popolazione mendeliana, e di adottare altri metodi disponibili per il calcolo della penetranza, ivi compreso quello ricavato dai valori di concordanza, che l'A. sta studiando.

RÉSUMÉ

Sur la base de l'étude par Bansal et Rife (1962) l'A. propose quelques groupements doubles des quatres lignes principales des paumes et de la position des triradii axiaux. Des intéressantes valeurs de pénétrance suggèrent de adopter les mêmes groupements chez des échantillons de jumeaux, chez de plus grandes familles tirées de la même population mendélienne, et d'utiliser d'autres méthodes disponibles, y compris celle dérivée par les valeurs de concordance, que l'A. est en train d'étudier.

ZUSAMMENFASSUNG

Auf die kürzlich erschienene Arbeit von Bansal u. Rife (1962) gestützt werden auf Grund einer unveröffentlichten Arbeit des Verf. (1962) gewisse Doppelgruppierungen der vier wichtigsten Handleisten und der Stellung der Achsentriradien vorgeschlagen. Einige ziemlich ermutigende Penetranz-Ziffern führen zu dem Vorschlag, dieselben Gruppierungen auf Zwillinge und anderes grösseres und reicheres, derselben Mendel'schen Familie entnommenes Material anzuwenden, sowie andere, verfügbare Methoden zur Berechnung der Penetranz, darunter auch eine vom Verf. gerade untersuchte Methode aus den Konkordanzwerten zu verwenden.

https://doi.org/10.1017/S1120962300016061 Published online by Cambridge University Press