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Further amputations of the tail in adult *Triturus carnifex*: contribution to the study on the nature of regenerated spinal cord

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SUMMARY

Adult Urodele Amphibians, if deprived of the tail, are able to fully regenerate it. This occurs owing to a typical epimorphic phenomenon which takes place in various phases. Within this matter, in particular on the reconstruction of the caudal nervous component, literature sources refer to a great quantity of research following only one amputation of the tail. Being aware of these data we programmed to investigate the possible persistence, decrease or disappearance of the medullary regenerative power after repeated amputations of the regenerated tail. With this objective in view, we have performed on adult *Triturus carnifex* a series of such operations at time spaced out from one another. In previous experiments, the amputations of the tail have been before seven and then nine. In the current experiment, the same specimens have been subjected to further removals of the tail. This study has developed into three cycles going on over a period of more than ten years. Overall, our panorama rising from the integration of present results and those of former observations is in agreement with what occurs in the area which is the centre of the beginnings of medullary regeneration processes and the bibliographic information concerning the pre-blastematic and blastematic phases. In the subsequent morphogenetic and differentiative phases, however, with the recurrence of the re-establishment of the spinal cord, these events proceed more slowly (gap which reduces when the time interval starting from the operation increases) than in the spinal cords which regenerated after only one tail amputation. Furthermore, although the regenerated spinal cords, if compared to normal spinal cord, show some anomalies (regarding medullary length and diameter, distribution of the spinal nerves and ganglia), the regenerated spinal cords (as well-known uncapable to re-form the Mauthner fibres and supplied with the Rohon-Beard sensitive neurons), their nerves and ganglia reacquire the same complex structural organization as normal spinal cord (where, already known, the Rohon-Beard larval neurons lack, because they play the same role of the spinal ganglia in adult life and disappear when these ganglia first appear). Therefore, at least within numerical bounds of our