

PARTS 2: EXPERIENCES & RECOGNITIONS NEW of Michael Mrutzek and Jörg Kokott the report published in the January edition this magazine on the dosage by Ethanol as a carbon source to the production of the Denitrifikation and the growth heterotropher bacteria found large accord in the German Riffaquaristik. Many Aquarianer adapted this new method of the direct dosage of Wodka into the aquarium and gathered at the same time many experiences, that quickly were discussed and evaluated thanks to the narrow experience exchange among other things in the internet. In this second part, the partly opposing experiences are supposed to be published and are supposed to be worked in into the existing knowledge over this method. In the last months since the publication, these experiences of Aquarianern contributed in addition that the advantages have themselves and disadvantages, as well as the applicability of the method strongly herauskristallisiert. First of all we, who thank us authors, in all the Aquarianern, would want, that described its experiences to us and have enriches therewith our knowledge. We perceive it as a large joy that many engaged Aquarianer contribute in addition to test, to criticize jointly a first of all new method, and to develop in the train of this positive criticism further. In contrast to - unexpectedly few - negative beforehand-criticisms and little reproducible Kontraberichten, is it thanks to this Aquarianer possible to compose the existing second part of the article

Now as ever this method is not commercially (d. h. we earn therewith no money), and no Aquarianer obligated itself with the purchase of the January edition of this magazine in addition to use and to test the method. That a new method, that was tested by several Aquarianern at different aquariums systems successfully over a sufficiently long period before the publication, does not function, in basically each German aquarium household, authors has prophesies no of us. How said treats, this article the practical experiences of Aquarianern that tested this method. From that a trained process, that concerns each user including the authors, results. I.e., it is here necessary to refer of our side on that that this article must be read by beginning to end, and correctly are understood to be sure so, that also the Dosierempfehlungen indicated in the following (in a bank transfer hangs one in the cash amount finally also no longer zeros on as necessary). It happened thoroughly very learned Aquarianern that in the attitude of Dosierautomaten, or in the calculation of the Wodkadosis necessary for the aquarium, mistake eingeschlichen have itself.

That through it thoroughly earnest problems can emerge, abundantly was clarified in the first part of the article. Nothing the in spite of we will discuss in the expanse about that. Also following misunderstanding is supposed to be created out of the world: the Ethanol dosierung in the aquarium has nothing with nitrate filter on Ethanolbasis (Wodkafilter, or Nitratreduktor of the firm Aquamedic) to do, also nothing with the dosage of vanilla sugar, honey, or dextrose. Certainly many Aquarianer have already Wodka, vanilla sugar, honey or dextrose, into its aquarium given, with more or less good success. To be sure was nothing published before our article in the January edition such, see justified we by therefore it as on to speak here by a new method. By the way, who the Latka publishing house for that responsibly draws that it did not function in the one or other Aquarianer, that can hit the already tested way of the reader letter to do around the displeasure Kund, or – whereon previously strange manner yet no one come is – to contact the authors themselves (for the purpose of enamel-contact: see www.meerwasserforum.com). Before we further get into into the subject, we would like to represent a survey out of the www.meerwasserforum.com and

of www.korallenriff.de. At this survey, altogether 79 Aquarianer took part, of which 30 indicated, that they did not use the Wodka-methode. Of the remaining 49 Wodka-users, 40 with positive judgment voted could, five Aquarianer no variations, neither positively nor negative, note, and 4 basin operators agreed off that they made exclusively negative experiences with this method. Supposed, would be this survey representative (what we do not know), are would want published speak 10% negative experiences for a new method of our view to be sure not bad, nevertheless we that of us method not prettily. There is report on problems, with which we would like to busy us in the following.

Denitrifikation vs. Biomass production the Wodka-methode is based on the fact that heterotrophe Denitrifizierer (denitrifizierende bacteria) are directed in the anoxischen (oxygen free) milieu on a carbon source in order to be able to transform the nitrate nitrogen in gaseous Distickstoff (N_2) energiebringend. This theoretical knowledge is old and in the form of nitrate filter for some time practically transferred. The report of Dr. Schlüter in the MA 3/04 offers functions a good overview, like the nitrate dismantling in the Aquamedic Nitratreductor (Schlüter 2004). This and all of other nitrate filter function, independent of the price achievement behavior. To be sure the handling of nitrate filter is generally not simple, also if this the manufacturers and distributor of nitrate filter so propagate. Within the nitrate filter, an anoxisches milieu must emerge, what can be regulated over the water flow rate. Within this closed reactor, a milieu, in which heterotrophe bacteria transfer so long nitrates in Distickstoffgas, emerges, until the nitrate completely is consumed. First then the bacteria begin that amply in the water available sulphate (SO_4^{2-} to reduce-), what becomes based on the decline of the Redoxpotentials in the nitrate filter, as well as at the smell recognizable. Poisonous emerges will be able to lead Sulfit (SO_3^{2-}), that into the aquarium ausgeschwemmt, and here to one devastating fish dead. How said function must be dedicated, nitrate filter, but the inspection of the nitrate filter certainly just so much attention, like the total aquarium. The direct dosage of Ethanol in the form of Wodka into the aquarium has vis-à-vis a nitrate filter a decisive disadvantage, that correctly was recognized by Dr. Schlüter: the total Ethanol does not reach the anoxischen zones in the aquarium and will become used there denitrifiziert, but rather a large part also in the sauerstoffhaltigen (oxischen) milieu of heterotrophen bacteria, that do not transform nitrate in Distickstoffgas. That at the same time decisive advantages vis-à-vis a nitrate filter is that these aerobic heterotrophen bacteria receive the carbon source available now and verstoffwechseln react, and at the same time with growth and an increased Zellteilungsrate, whereby they consume potentially nitrate and phosphate. On the other hand the phosphate withdrawal is not worth mentioning in nitrate filter. A nitrate filter does nothing other when nitrates to transfer in Distickstoffgas.

In the dosage of Wodka into the aquarium becomes therefore both the Denitrifikation and the bacteria biomass production promoted. To be sure the ratio between increase of the Denitrifikationsrate is and biomass production dependent on the respective aquarium, what the numerous observations of Aquarianern with the Wodka-methode show.

Many Aquarianer were able to observe, sunk became remained that first of all only the nitrate salaries, and the phosphate salaries more or less unchanged, comparably with the use of the Aquamedic Nitratreductors. Through it a Stickstofflimitierung was evoked in some aquariums, that evokes in coral i. d. R. with stagnating growth and bad polyp picture, in

Extremfällen with Ausbleichungserscheinungen.

Other Aquarianer were happily in the observation, that simultaneously both the nitrate salaries and the phosphate salaries sunk has, and through it two flies with a flap struck became themselves. Through it remedy was produced readily a nutrient arm milieu that by many Aquarianern as inevitable for the optimization of the Farbigkeit in stone coral looked at becomes. Reached me (J. Kokott) however also some references, that one with Zeolithen „the last Kick out of the Farbigkeit in stone coral out itch can“. He who has good eyes, can pursue this reference, deliberately should be itself to be sure its that the sea water suitable Clinoptilolithe Ammonium präferenziell adsorbieren drastically can change, and at the same time in combination with the Wodka-method the milieu conditions. Nevertheless a combination of Zeolithen with the Wodkamethode is possible (X 2004).

The last variant describes a speedy phosphate withdrawal in simultaneously unchanged nitrate salary, i.e. in these felling became in a continuation of the Wodkadosierung a Phosphorlimitierung produces, that can have in contrast by far worse sequences to a Stickstofflimitierung. A Phosphorlimitierung leads especially in stone coral to a quick end pale. As a rule the tissue dies out whereby the polyp picture in the yet healthy tissue is right good. In addition phosphorlimitierte kleinpolypige stone coral become not photo sensitive, i.e. it are in its defense mechanisms against radiation stress restricted, and rarely becomes over „burned tip“ in Phosphorlimitierungen reported.

Nitrogen and Phosphorlimitierungen are not rare in aquariums – independent of the used filter systems –. Through a too strong use of phosphate bandage means (Phosphatadsorbern) Phosphorlimitierungen are produced, in aquariums systems, the for example one high ground reasons with strong nitrate dismantling achievements (z. B. DSB, Jaubert or Miracle Mud systems), are Stickstofflimitierungen not rare.

The question that many Aquarianer place itself is why Riffaquarien react so differently to the Wodkadosierung. This subject is very complex, and to clear only extension manner. The simplest extension illuminates the bacteria composition in the aquarium. Fundamentally all coatings with bacteria are settled in a brought in Riffaquarium, therefore both the decoration (stones, ground reason), the used filter materials, the disks and the tubes. On these settlement areas, bacteria are. A multitude of these bacteria is heterotroph, independently of whether they live in an oxischen or anoxischen milieu. How Dr. Schlüter correctly notes, most bacteria are optional anaerobic (Schlüter 2004), i.e. it can with, and without oxygen live, whereby it its metabolism speedily of the one, on which other way shift can. Next to the heterotrophen bacteria, also autotrophe bacteria be found designated prevent in all Riffaquariensystemen, all ahead that as a Nitrifizierer bacteria, that transform Ammonium over Nitrit in nitrate, (see in addition Kokott 2004), and at the same time, that themselves poisonous Nitrit in the water anreichert.

In the reply of the question why aquariums so differently behave in the Wodkadosierung, must be observed in our opinion the ratio between autotrophen and heterotrophen bacteria. It would be already here angemerkt that we have as a Hobbyaquarianer no possibility to

measure the bacteria composition in our aquariums, i.e. the following carrying out are very speculative. Nevertheless we hereupon somewhat more closely would like to go in, and offer some case studies.

Case study 1: fast nitrate withdrawal, slow phosphate withdrawal the autotrophen bacteria are not be influenced generally of a carbon source as well as Ethanol or Acetat dependent, i.e. it of the Wodkadosierung not authoritative. If the autotrophen bacteria predominate in the aquarium, and be for example the heterotrophen bacteria mainly in the anoxischen zones of the living stones and the ground reason, will be not strong the biomass production through the Ethanolfütterung. Here the Ethanol arrives then over diffusion, and/or through the current dependent water entry in the ground reason at the heterotrophen bacteria. Latter can use the Ethanol, around nitrate in the anoxischen milieu to denitrifizieren so that here the nitrate dismantling in aquariums speedily results. Based on the slight energy revenue in the anaerobic metabolism (see Schlüter 2004), a strong increase of the heterotrophen bacteria stays away however probably so that the phosphate salaries authoritative does not change. From that the described first case can arise, namely a nitrate fast, but slow phosphate withdrawal.

Case studies 3: fast phosphate withdrawal, slow nitrate withdrawal this case appears goes first of all contradictory, for a phosphate withdrawal i. d. R. with the growth of organic film along, with which however also nitrate becomes consumed, (cf. case studies 2). An essential component of Zellmembranen and the carriers of the Erbsubstanz (DNA, RNA), i.e. if itself a bacterium part, is must Phosphor both produced new diaphragm material and the Erbsubstanz are copied and newly produced. In contrast to growing organisms, the Phosphorgehalt in the living cells is not more or less constant, i.e. growing organisms deliver in the net balance exactly so much Phosphor at its environment, how they newly receive Phosphor again out of the environment. If therefore phosphate is withdrawn out of the water, this would mean that the bacteria increase themselves and construct therewith bacteria biomass. To be sure also nitrogen, for example as a nitrate, would have to be consumed at the same time. Based on the increased Abschäumung through removed bacteria flake (Bakterioplankton), the bacteria growth in these basins is also demonstrable. Is the question only, which nitrogen source except nitrate in this case are used? Fundamentally it gives different nitrogen source in the aquarium, both inorganic nature (Ammonium, Nitrit, nitrate), and to organic nature (amino acids, Aminosucker). For bacteria applies like to plants that Ammonium is preferred based on the nitrogen contained reduced therein for the amino acid production and protein production the nitrate-Anion for energetic reasons. In the nitrate-Anion, the nitrogen oxidiert, i.e. nitrate must of the bacteria and plants first energy costly to Ammonium reduced become, is before it can become into the amino acid synthesis eingeschleust. It the case can be given therefore, consume that the bacteria not nitrate, but rather Ammonium which is not measured as a rule in brought in aquariums. Fishes deliver germinated becomes Ammonium over that constantly at the water, i.e. in each aquarium with fish possession Ammonium permanent nachgeführt. This is remains is withdrawn develops from the case, the nitrate salaries unchanged, only Ammonium the water, and an imbalance between the nitrogen and Phosphorgehalt in the water. The Denitrifikationsrate of the Ethanol dosierung does not remain also will not sink unaffected (z. B. if that dosed alcohol into the anoxischen zones arrived, and previously of

aerobic heterotroph bacteria consumed becomes), the nitrate salaries.

A further possibility is that in the aquarium available organic material is settled in the form of lining remainders, Detritus, or died out algae remainders and animal remainders by bacteria. The bacteria zersetzen at the same time this organic material and relate from that the nitrogen important for its growth and Phosphorverbindungen. Depending, how this organic material chemically is put together, one can imagine that the bacteria take phosphate out of the water, nitrogen however out of the organic material, on which they grow. Also this possibility can be requisitioned as an explanation for this phenomenon.

Cases were described measurement of the biomass production, reduce, in which the growth of the bacteria was so enormous, that on the disks and in the pressure tubes thick bacteria coatings developed, that are one optically extremely troublesome to that, to the other however the current speed in the tubes. Latter leads in addition that the pump achievement drastically returns, and the tubes regularly must be cleaned therefore, what is however impossible in most felling. Reports according to the development of bacteria coatings was on the living stones or the ground reason then avoidable, if the current in the aquarium through stronger or additional pumps increased became (Robert Baur, pers. Mittlg.) On the other hand a friendly Aquarianer, Erwin Kerkenberg reports that the development of bacteria lawn clearly more quickly resulted at the aquariums disks in strong current, and/or entirely stayed away at little beströmten disks. This walks also with the observation that the bacteria lawns emerge especially in the pressure tubes.

Measurement of the biomass production

One bears emerges pull himself the development of organic film in mind, in increasing thick of the organic film in the lower regions both an oxygen deficiency, and a nutrient deficiency, for the bacteria developing itself at the surface the organic film the oxygen and the nutrients quickly out of the water. In addition comes that the current speed in the organic film strongly decreases gradually of outside after interior, so that the carrier of oxygen and nutrient empire water in the organic film strongly is restricted. There, where the current speed high enough is, can penetrate nutrient empire water into the organic films, and so that also the bacteria furnish, that are in the interior of the bacteria lawn. Through it the bacteria lawn will increase also at thick, for the bacteria in the interior remain potentially longer alive. On the other hand die in organic film, that grow at current weak regions, the bacteria in the interior off, and therefore the organic film total is a mixture out of dead and living cells. These unstable organic films more easily can dismantle, and/or such that are throughout living become not as thick as. Also this is solely the attempt of an explanation, no longer.

Why is the production of bacteria lawn however in some few aquariums extremely high, in other however very low until hardly perceptibly? Decisively the measurement of the fish feeding and invertebrate feeding is in our opinion first of all once. Just in aquariums, that show a high entry of dust lining and fish lining, a nearly inexhaustible nutrient source stand the heterotroph bacteria to the decree. The nutrients nitrates and phosphate are incorporated immediately in biomass, are prefaced, received the bacteria sufficient carbon in the form of Ethanol. Through it the inorganic nutrients nitrates and phosphate in the water remain slightly concentrates, but the organic films proliferate regular. If then unterdimensionierte are used or ineffective working white scum, that cannot be removed sat

down into the water ausgeschwemmten bacteria sufficiently, and then again in the aquarium off.

Another important point the composition of the bacteria coatings concerns. The Ethanol dosierung influences unspecifically the Bakterienflora, for Ethanol is an universal, easily useful carbon source that can be used potentially by each heterotrophes bacterium. It is at the same time not possible to identify the bacteria. Solely microscopic investigations of bacteria coatings can give a reference, around which bacteria it could act itself. The bacteria coatings examined by us showed a filamentöse (fadenförmige) structure. Many bacteria do not exist as single cells, but rather remain after the Zellteilung in an association. If the division even in the cells does not change, bacteria cells emerge Zellfäden from several hundred to thousand. The variety of mariner bacteria is declared sheerly endless, and moreover only for a fraction. Also the amount of well known filamentöser bacteria is not exactly slight so that the determination of the bacteria is very difficult. Coming from the acceptance that Riffaquarien in its bacteria composition strongly differ, are concerned of the extreme bacteria lawn development possibly only the aquariums, that such filamentösen bacteria contain. Cells other bacteria that do not grow fadenförmig, but rather a loose Zellverband out of few, did not harden form can remove, in corresponding growth therefore more easily of the substrate and become effective abgeschäumt.

(Continued in next post ...)

Extracted from:

<http://www.elegancereef.com/smf/index.php?topic=841.0>

Bakterioplankton vs. Bacteria

Coatings already in the first part of this article the subject of bacteria blossom was treated. The concept designated equivalently to the well known Phytoplanktonblüten the condition of a strong water dimming, stipulates through the strong increase of bacteria (Bakterioplankton) available in the free water. Such a bacteria blossom can emerge through an over dosage of Ethanol in combination with increased nutrient salaries (nitrate, phosphate).

Is in the first part of the article by our side first of all supposed become that such blossoms are to be avoided potentially dangerously, and therefore by a controlled Wodka dosierung unconditionally, was described since appearance of the article no case, in which bacteria blossoms in the water caused earnest problems.

Some Aquarianer reported for example in the www.meerwasserforum.com of bacteria blossom, confused this however with the already discussed bacteria coatings why we would like to differentiate at this place between Bakterioplanktonblüten and bacteria coatings. Altogether the appearance of Bakterioplanktonblüten seems to not to be very frequently although the test basins requisitioned before the publication did not show this phenomenon rarely in the frame of a Wodka überdosierung. An increased bacteria density (total germ number) in the aquarium water is to be sure characteristic for the Wodka methode. Best indication is latter can an increased Abschäumleistung, but also a better polyp picture in the coral, for that Bakterioplankton (like in nature) use as a nourishment source.

Frank Diehl reports in an article on www.korallenriff.de, that its Gorgonien to free itself already at the beginning of the Wodkadosierung strongly verschleimten, i.e. the bacteria density in the water makes it especially these coral heavily, of the bacteria. On the other hand the azooxanthellaten coral of Aquarianern as well as Dr. Jens Kallmeyer or Sabine Mülder show none of these signs. The key is herewith the Bakterioplanktonproduktionsrate which is individually different again of many different factors (Wodkadosis, feeding, measurement of the Mulmansammlungen, etc.) dependent and therefore in each aquarium. Bakterioplanktonblüten are reacted, for example with the use of newer active coal, through the dim water for the Aquarianer recognizable, so that each caretakers immediately with countermeasure increase of the Abschäumrate, additional ventilation, and where appropriate use of ozone. Through it certainly larger problems are avoided, that potentially can emerge, if one has no inspection for example on vacation over the basin. If a Bakterioplanktonblüte emerges involuntary, should be reacted with the named countermeasures, counts otherwise also in this second article: the Ethanol dosierung must result so slowly and controlled that Bakterioplanktonblüten can emerge not at all first.

Ethanol and yellow water

In some few felling was reported, that itself directly after start of the Wodkadosierung the aquariums water strongly yellow verfärbte (Frank Diehl, pers. Mittlg.) Yellow materials are langkettige organic connections (z. B. Phenole), that of bacteria and plants at the water delivered become, but to dismantle even of bacteria only heavily are. The heavy degradability demands the use of ozone or active coal in the aquarium so that the substances can be destroyed or bound. We assume that the production of yellow materials in the connection with the Wodkamethode walks therewith, that bacteria are not released for example died out vegetable material zersetzen, and at the same time the yellow materials realizable for bacteria at the water. Yellow materials are no specific connections, but rather a group of substances that yellow appear through its light absorbent characteristics in wässriger solution. Coral and algae produce a multitude of yellow materials and other, pale connections that are poisonous for other organisms. Such defense material and battle materials, that are produced for example of course by soft coral and are delivered at the water, make to hold it in many soft coral of dominated aquariums impossibly, retroactively used stone coral long-termed alive. A yellow material development appearing in the train the Wodkadosierung should be removed by the use of ozone or active coal by therefore

Bacteria growth and oxygen salary

It is extremely deplorable that some Aquarianer had to learn within less hours a rapid fish dead. Are confessed us altogether three cases, with which fishes are deceased over night. Trigger for that fish dead an acute oxygen deficiency that is to be explained easily was. The bacteria settling aerobic in the sauerstoffexponierten (oxischen) zones the aquarium are exact like fishes or coral dependent by oxygen. Correspondingly they withdraw in the night if the photosynthesis of the algae stops and coral, enormously much oxygen out of the water, exactly like all coral living in the aquarium, fishes, and algae. For example the water current is too slight, and or no scum and no ventilation system available, can decrease the oxygen

salaries in the water within less minutes to a minimum. The first animals that die then are the fishes. How said regret, we it very that we had no expanse visibility in the composing of the first article in order to predict these cases. To be sure we did not refer to the importance of an Eiweißabschäumers, however in connection with the oxygen provision. All aquariums, that show a Überlaufsystem and a white scum, should be freed overflow by this risk, for by that and becomes the scum the water with oxygen angereichert. All aquariums, that were tested before the first publication, were with a Überlaufsystem and with a white scum equipped.

Aquariums will overflow therefore without and operated without white scum, a ventilation system should be installed immediately that directly after extinguishing of the illumination turned on becomes.

Ethanol and fish illnesses

It already was mentioned that the Ethanol dosierung reacts unspecifically to bacteria growth. It is therefore possible that also krankheitserregende (pathogene) bacteria of the Wodkadosierung profit. End of veterinarian medical visibility is this to this extent questionable when that pathogene bacteria are adapted usually very specifically to its proprietors. Infections internal agencies can at the same time (z. B. stomach-Darmtrakt), but also äußerliche agencies (skin, germinated) concern. In how far such bacteria specialized directed are on an external carbon source, can be said by our side out of heavily. Many bacteria are not moreover outside of its proprietors long viable based on the proprietor specialization. They form in any case duration stadiums, i.e. it encapsulate itself and wait, until they can infect a new proprietor. At the same time the cells are is shuten down however i. d. R. metabolisch inactive, i.e. its cellulose change so well how. Nevertheless were discussed in the internet of cases, with which the Wodkadosierung responsibly was made for the appearance by fish illnesses. Argued became at the same time for example with the long absence of fish illnesses in the aquarium before start of the Wodkadosierung, and with the decline for example of skin dimming with fishes after dropping of the Wodkas. It is not to be excluded fundamentally that the increase of the Bakterioplanktondichte in the water leads in addition, that the defense mechanisms of the fishes can withstand the enormous bacteria pressure no longer. First of all appearing bacterial skin dimming ability then by secondary infections with other, not-bacterial parasite accompanied become.

More last earnest problems can stretch after. Critical, and in the aquariums bearing not undisputed fishes as well as Acanthurus leucosternon (Weißkehl doktorfisch), or after the import weakened or badly nourished Anthias sp. (Flags perch), more strongly can be jeopardized at the same time. To be sure only very few cases, that were described for example in the www.meerwasserforum.com, were it.

We take this subject very seriously, and in the expanse, we will show possibilities how the risk of appearing fish illnesses in connection with the Wodkadosierung can be minimized. Nevertheless, the subject of illnesses is as old as the Aquaristik, and if sensitive animals as well as palette doctors, Weißkehl doktoren are held, or flags perch joint with pressures fishes and other „tough“ together, the most necessary is done with the purchase of these animals already in order to have to explain itself with the subject of fish illnesses long-termed. Also if

it here the subject is not, but select is generally is favored the type and manner, like Aquarianer its fish possession partially very doubtful, and just in such aquariums then the appearance of fish illnesses. We do not doubt that the Wodkadosierung in these felling does its in addition, it is here only the question whether the Wodka is or that something „special“ fish love of many an Aquarianer guilt at fish illnesses. Into the 32000 liter aquariums of the district savings bank Osterholz in Osterholz-Scharmbeck in Bremen a half bottle of Wodka will dose weekly, with a very high fish possession, that only so abound before health. The fishes can swim round basin of high in this 6.70 ms with 2 meter diameters the entire day without having to turn around only once. And this is not the single basin that is undisturbed in spite of extensive Wodkadosierung of fish illnesses. According to our opinion the Besatzdichte play here, and above all the composition of the fish partnership an essential role in the stress reduction in the fish bearing.

Applicability of the method dependent upon the aquariums system

One herauskristallisiert has itself in the last months clearly: the success of the Wodkadosierung hangs of the related aquariums system off. To be sure there are exceptions, but the method generally suits itself best in Berliner systems that are arranged with little ground reason and many living stones. The Wodkadosierung is problematic on the other hand in sand bed filter, as well as in Deep sand Bed- (DSB), Jaubert-, or Miracle Mud - systems. How gives, exceptions said it always, are us also some DSB- and Jaubert basin confessed, in which the Wodka-method functions, generally however by far not so going through positively like in Berliner systems. What is the reason for that? Sand bed filters offer an enormously high settlement area to the bacteria. Each sand grain is surrounded of an organic film, and the littler the grain size, the available settlement area is the larger if one compares the same volume of a feinkörnigen to a coarse-grained sediment. In addition comes that there are many sediments, that one in surface possess, so for example coral breach, even if it finely is ground. The total surface in sand bed filter is accordingly enormous. In Miracle Mud filter and in most American DSB systems, the related sediment is is extremely fine, correspondingly high the settlement area for bacteria.

Such aquariums systems have generally a very high nitrate dismantling achievement, and it does not amaze crash can therefore, that in a Wodkadosierung the nutrient salaries regular, and to be sure over night. Straight Stickstofflimitierungen nearly are preprogrammed here.

A further point concerns the already discussed oxygen withdrawal. The more bacteria in the aquarium are available, the faster these bacteria in the dark phase become the oxygen in the water veratmen. Consequently it is in such systems very important to worry for a good ventilation. If such sand bed filters are used as a dauerbeleuchtete algae refuges, this reference vernachlässigbar is, for the photosynthesis of the algae brings the water all around the clock oxygen.

Zeolithfilter are with the Wodkadosierung kombinierbar, to be sure the physiko-chemical characteristics of the related Zeolithe must be confessed. The Clinoptilolithe related in the Meerwasseraquaristik interfere by the adsorption of Ammonium directly into the nutrient household of the aquarium. They offer bacteria a gigantic internal and external surface. The of surfaces external on the sauerstoffexponierten settling Nitrifizierer „meadows“ the

Ammonium off and transform it in Nitrit and further to nitrate. Based on the spatial vicinity between oxischer of external surface and internal anoxischer surface, the nitrate arrives quickly at the anaerobic Denitrifizierern why biologically active Zeolithe share very good Nitratabauleistungen. The high flow rate in Zeolithfiltern furnishes also the denitrifizierenden bacteria in the anoxischen interior of the Zeolithe with Ethanol so that the nitrate dismantling becomes yet more effective, so that a Stickstofflimitierung can be the sequence.

We hold said suited how the combination of the Wodkamethode with Zeolithen throughout for. It naturally is justified to remain faithful to the established Zeovit-system, for with this method, also very pretty aquariums are operated.

Optimization of the Wodkamethode?

With the knowledge standing us today to the decree – into half year after the first publication – that with aid of many Aquarianer gathered became, can be optimized the Wodkamethode. The appeared problems were discussed illuminated until here, and the possible causes. Now attempts toward implementation are supposed to be offered in order to make the Wodkamethode yet more certain.

Modified Dosierempfehlung

It already was addressed that many Aquarianer mistakes made in the calculation of the correct Wodkadosis. Each should addressed feel slink at the same time, for such mistakes of happened both beginner and pro, and itself usually then on if one makes such calculations once just between „door and hinge“.

To the further simplification, the Dosierempfehlung is indicated for an initial period of three weeks than a Dosierschema in tables form. It is referred once again on that, would stand off that the nitrate salary and phosphate salaries regularly, best in by 3 days, but measured become at least once per week.

Possibly the nutrient salaries change already after the first week. Sink depending like quickly the values, is mounted it to modify the above mentioned Dosierempfehlung, i.e. that one raises for example instead of an increase of 0.5 mL on the total aquarium after the first seven days only by 0.2 mL.

After the first three weeks, one can raise the dosage weekly by 1 mL (except in little aquariums until 300 L, here are 0.5 mL more certain). If the nutrient salaries begin to sink clearly (then really every three days measure), the Wodkadosierung not further should be increased (however not stopped become!) It is possible that that suffices until dose reached there in order to sink to the nutrient salaries the desired level. The nutrient salaries remain however from a certain point constant, one slowly can raise, for example by 0.5 – 1 mL per week, to enable the dose again around a further reduction.

Long-term dosage

It was outlined that the Wodkadosis considerably can be sunk in the long-term dosage in order to hold the nutrient ratios on the desired level stably. Also if it was initially necessary to increase the dose further, in order to be able to layer the nitrates and phosphate salary, is for the stabilizing of the values i. d. R. only the 1/2 until 2/3 of the dose necessary. Also

here the new dose should not slowly adapted sunk become, and drastically.

This dose decline is necessary in order to minimize the probability for the origin of bacteria coatings in the aquarium as well as in the filter. The test basins requisitioned before the first publication have run now already for more than 1 years, the unit by Michael Mrutzek already since almost three years on a level that the development prevents of bacteria coatings. Bacteria coatings appear, the dosage can be stopped for some days in order to begin subsequently with the half of the dose again

What do in Nährstofflimitierungen?

How on the first sides discussed became, do not fall the nitrates and phosphate salary always uniformly. If the nitrate salaries to quickly sinks, that phosphate salary remains however unchanged, one can bring the aquarium with the dosage of Ammoniumchlorid or calcium nitrate nitrogen again. Through it the ratio between nitrogen and Phosphatphosphor in an area, that the reduction of phosphate favors long-termed, remains. It gives described is numerous reports, in which the manufacture of such solutions (z.

B. <http://www.hornsriff.de>, www.korallenriff.de presentation J. Kokott Sindelfingen 2003).

Also it is possible to work here with Phosphatadsorbern whereby one should not exaggerate the Adsorberdosis (many Adsorber bind phosphate very effectively). If the phosphate salaries vis-à-vis the nitrate salary to quickly sinks, the manufacture of a phosphate solution offers itself. In addition one solves 7.16 g (7 g on scales is also in order)

Kaliumdihydrogenphosphat (KH₂PO₄, molecular weights 136.1 g/mol) in 1 L osmosis water, in which then 5 g phosphates are contained. In order to enable a risk free dosage in the aquarium, this tribe solution must thin become once again around the factor 1:10 whereby one decreases 100 mL of the tribe solution, this into a new, clean container transported and gives 900 mL osmosis water in addition. In this use solution, only 0.5 g/L phosphates are contained now. In the daily dosage of 1 mL of this use solution on 100 L net aquariums volumes is raised the phosphate salaries around 0,005 mg/L per 100 L. A higher phosphate dose is necessary in correspondingly fast phosphate reduction, the dosage of the phosphate solution can be increased correspondingly by 1 ml/100L. Here a Phosphorlimitierung is prevented through the supply of phosphate so that in the further Wodkadosierung long-termed the nitrate salaries sunk will can. It would be referred here on that that the manufacture of the phosphate solution must be carried out very careful. Mistakes slink itself here on, a too high phosphate dosage can stretch serious sequences after. Straight in the discussed sand bed filter the dosage of a nutrient solution is the possibility of the choice in order to use the Wodkamethode also in such systems successfully. If in sand bed filter of for example the nitrate salaries to quickly fells, the dosage of an Ammoniumchorid- can or calcium nitrate solution one Stickstofflimitierung to be feared prevent.

Partially sand bed filters in its nitrate dismantling achievement are so strongly that anyway with nitrogen solutions worked will must, how the Miracle Mud aquarium proves of Markus Resch.

Use of ozone and UV-units

It proved itself in many Aquarianer to connect ozone and UV-units to the basin, in order to reduce the yellow material development and the Bakterioplanktondichte and/or the total

germ number in the water. These methods are established for very long time in the Riffaquaristik. Most aquariums with a high fish possession are equipped anyway with an UV-unit. Ozone can be brought in slight doses to the scum. Yellow materials and bacteria are destroyed can become through the combined Ozondosierng and UV-irradiation, and effective abgeschäumt. From that resulted on the one hand a minimized probability for the appearance of fish illnesses, on the other hand the water is freed of yellow materials and strongly is reduced the risk for the origin of bacteria coatings. To be sure this method was developed are in order to reduce the measure at necessary aquariums technology, to be sure both offer ozone and UV-units technology components that represent on the one hand a slight care expense and maintenance expense, and on the other hand numerous advantages, that stabilize and improve the aquariums system long-termed. We hold the combined use of ozone and UV-unit for an essential step in the optimization of the Wodkamethode.

Nourishment of coral in low nutrient salaries

Many Aquarianer were surprised regular how fast a nutrient withdrawal with the Wodkamethode is possible. Without making itself beforehand far thought over this subject, Aquarianer were sudden in the situation to busy itself with the nourishment of coral. We must criticize ourselves here self that we did not take up this subject already in the first publication, although there is some younger publication out of the last year, that busy itself with the subject. First of all it is not goal of this method of sinking to the nitrate salary and phosphate salaries a level, that with which to the decree standing test not at all more are demonstrable us. Rather it is sense of the method to be able to control the nutrient household in the aquarium based on the Wodkadosis. All Aquarianer do not represent the standpoint that the aquarium water of nitrate salaries and phosphate salaries must snatched up show as well as in the natural. It gives maintained become innumerable examples for crazy aquariums, that thoroughly with nitrate salaries by 10 – 20 mg/L, and by 0.1 mg/L to phosphate salaries. It is to be understood importantly that in the sea a by far larger nourishment spectrum exists. Above all partikuläre nourishment as well as Plankton or nutrient empires sediment are in the aquarium scarce commodity. The increase walking with the Wodkadosierung of the Bakterioplanktondichte is an essential advantage of this method. The Bakterioplankton is can received very nutritious, and of coral and utilized become. Nothing the in spite of coral cannot survive if the Ammonium/nitrates and the phosphate salaries on zero sunk becomes. In nature, these inorganic nutrients very slightly are concentrated to be sure, but they are always in these quantities available, with only slight seasonal variations. That is, the coral and algae can fall back always on these basis nutrients, also if they relate the large part of its nourishment over partikuläre nourishment. If therefore such nutrient arms conditions in the aquarium erstrebt become, one must be aware himself the danger that the boundary between nutrient availability and nutrient deficiency is very narrow. In addition one must consider how one nourishes the coral. In numerous presentations and in the literature of the past years was referred again and again on that that the availability of nourishment is more minority for the coral of an important point in the Riffaquaristik, that unconditionally must be improved. Correspondingly we find next to Spurenelemente- and amino acid solutions also dust lining means in the trade that show slowly however certainly into the correct direction. Also if the optimal coral lining not yet is invented or found, the marketable dust lining means represent a possibility how one

can furnish coral with nourishment. Now as ever also the Phyto- is and Zooplanktonzucht a correct way, for here one can entirely aimed with the manufacture of suitable culture media nutrient in Phytoplankton and last of all Zooplankton anreichern. Vegetable and animal Lebendfutter have release importantly appears be included moreover the decisive advantage, that the lining organisms based on its Zell- and/or body movement in coral of a lining attraction also the provision with suitable amino acid solutions these organic nitrogen connections also in nature of coral to to us and help climbs to guarantee the nitrogen provision of the coral with the increased feeding of coral naturally also the nutrient salaries on, so that. Importantly is to be understood that in the aquarium remaining lining remainders are settled by bacteria, i.e. the origin and Etablierung of bacteria coatings then strongly is favored. This effect can be prevented by a regular, but slight feeding. Also the current in the aquarium should be improved in order to be able to minimize the deposit of lining remainders. Certainly it is reinforced bring in can an advantage of the Wodkamethode to layer the inorganic nutrients nitrates and phosphate so far, that one partikuläres lining into the aquarium. Through it one shifts the nourishment spectrum of the coral and reaches – what the nourishment wise concerns – a nature more similar bearing of the cultivated animals. Nevertheless, the measure of the dust feeding is restricted essentially in that in strong feeding the bacteria coatings can increase themselves. Also problems with glass roses are preprogrammed, for these begin to explode in availability of more minority nourishment regular. The measure possible for the individual basin at dust feeding must be determined therefore even.

Summary

End we hope to have delivered important information with the existing second part round around the subject of Wodkamethode. Certainly further contributions will appear in the coming months to this subject of engaged Aquarianern so that of our side a third part is possible. Each aquarium functions differently, and each aquariums system and each method has advantages and disadvantages that come in different aquariums differently to the stamp. We wish take place by means of hope all Aquarianern much this method, and further for a lively experience exchange.

Extracted from:

<http://www.elegancereef.com/smf/index.php?topic=841.0>

From the thread:

Vodka Method - Part 2

Kokott & Mrutzek

Original German Language Article: http://www.meeresaquaristik.de/html/body_vodka2.html

Extracted from German Forum: <http://www.korallenriff.de/>