跬步集

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致谢

绿树浓荫、楼台倒影之际，担此编辑之重任，吾惶惶乎恐不尽其责。此刊之成，得益于多方供稿，感激之情溢于言表。

积跬步以至千里，汇小流以成江海。君子唯务本，方可道生。

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目录

芳香骨架的世界（1）

张千

我曾发过一段微博，只 140 个字，记录的是自己意识中突然出现的对含碳物质的质芳香结构的感叹。而当时，我应该是正光着脚丫，把自己锁在办公室里，琢磨着水溶黑碳（DBC）的来龙去脉。反正后来，怡欣和孙悦这两个妮子，就在我们的“忽悠”下，开始念 DBC 这本经，并不得不把 DBC 当作她们博士论文的主要研究对象，如此这般地，修行了起来。

DBC 没什么神秘的。按我的理解，它的主体，其实就是多环芳烃（PAHs），只不过更多地是很多芳环的“大”多环芳烃，因结构上有极性官能团/取代基，于是有一定水溶性。当然，也可能是没有极性官能团的大芳烃，但尺寸小过 0.45 微米，在过滤时进入“真溶液”，即操作定义上的“可溶”BC。

记得在 10 余年前，我曾在 ES&T 还是什么刊物的什么文章（反正我现在竟找不到了，求找到 ing…）中看到过一幅高倍数的 BC 扫描电镜图像，显示有无数的芳香骨架，经层层纹纹的堆积，而成了 BC。那画面虽不太美—挺象是一堆牛粪的，但始见 BC 的真像，我还是被震撼到了！

习大大 2015 年访问英国，专门去了 Manchester 大学，因为华为在那里共建着一个石墨烯研究中心，中心里，有 2010 年诺贝尔物理学奖获得者 Andre Geim 和 Konstantin Novoselov，他们获奖的原因，是 “groundbreaking experiments regarding the two-dimensional material graphene”。 石墨是由石墨烯一层层叠起来构成的，厚 1 毫米的石墨，大约包含 300 万层石墨烯。有趣的是，在很长的时间里，制取单层石墨烯的努力一直没有成功。一直到 2014 年，这哥俩发现，用胶带从石墨上粘下薄片，这样的薄片仍包含许多层石墨烯，但反复粘上 10 到 20 次之后，薄片就变得越来越薄，最终可产生一些单层石墨烯。这个看上去非常简单、一点儿也不高科技的方法，并不是他们的首创。在此之前就有人试过，但没能辨识出单层石墨烯。不管怎样，想到一场胶带撕逼大战，竟一不小心撕出个诺奖来，我也是醉了☺

他们撕出来的 graphene，就是理想的二维芳烃骨架，无边无际地（图 1）。再

回到怡欣、孙悦们的 DBC，则其又何尝不似是从 BC 上一层层脱落下来的（图 2）！只不过在自然环境里没有胶带，起作用的是风化（weathering）作用，其本质不外乎（1）机械剥落—谁还不曾脱过层皮呀；（2）化学氧化；（3）微生物氧化。

于是，我们有这样的两个“对子”：BC（堆积）—DBC（单原子层）；石墨（堆积）—石墨烯（单原子层）。如果 BC= EC（元素碳），又石墨=EC，于是 graphene=DBC。至少我认为，虽然不是所有的 DBC 都是 graphene，但水里的 graphene，却可认为是 DBC。

（下期再续…）

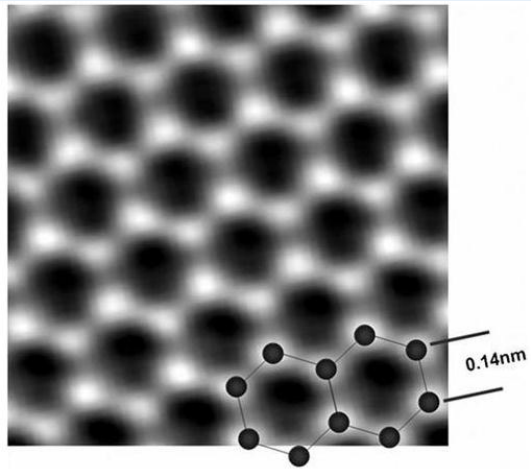

图 1 石墨烯的电子显微照片，示芳香骨架。（图片来自互联网）

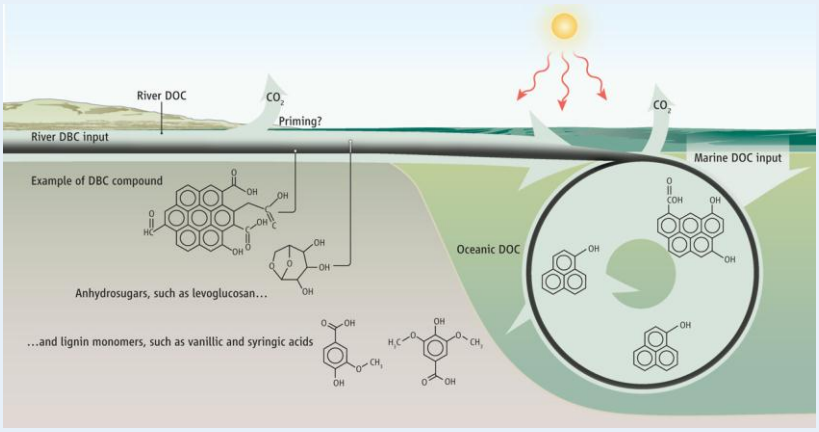

图 2 DBC 就象是“肥肥的长了角的”多环芳烃（芳香骨架）。（Masiello and Louchouarn, Science, 2013, 340:287-288, DOI: 10.1126/science.1237688）

Introduction to the paper on 'evidence of in situ biodegradation of phenanthrene in PAH-contaminated sewage water revealed by DNA-SIP coupled with pure culture isolation'

Jibing Li

Polycylic aromatic hydrocarbons (PAHs), as a type of hydrophobic organic compounds with fused aromatic rings, which can generate from both natural and anthropogenic processes, has posed a serious hazard to the health of human beings and other living organisms (Baek et al., 1991; Xue & Warshawsky, 2005). Because of their highly toxicity, mutagenicity, and carcinogenicity, the United States Environmental Protection Agency has classified PAHs as priority pollutants in ecosystems since the 1970s (Keith & Telliard, 1979). PAHs released into the environment could be removed through physico-chemical methods and bioremediation. However, the conventional physical or chemical technologies have drawbacks as a result of high cost and difficulty in operation, and furthermore they can cause secondary pollutions to the environment (Mamma et al., 2007). Bioremediation, based on certain microorganisms, is a cheap and effective technique to remove or neutralize pollutants from a contaminated site. Yet the primary process for effective removal of PAHs is bioremediation (Harayama, 1997; Wilson, 1993).

In order to explore the fate of these contaminants, considerable efforts based on traditional cultivation studies (cultivation-based techniques) have been concentrated in the isolation and identification of microorganisms able to degrade them. Hitherto, many reports are available on microorganisms capable of degrading PAHs. Most of these bacteria belong to the genera *Agmenellum*, *Aeromonas*, *Alcaligenes*, *Acinetobacter*, *Arthrobacter*, *Bacillus*, *Berjerinckia*, *Burkholderia*, *Comamonas*, *Corynebacterium*, *Cyclotrophicus*, *Flavobacterium*, *Moraxella*, *Micrococcus*, *Mycobacterium*, *Marinobacter*, *Nocardioides*, *Pasteurella*, *Pseudomonas*, *Lutibacterium*, *Rhodococcus*, *Streptomyces*, *Stenotrophomonas*, *Sphingomonas*, *Vibrio*,

Paenibacillus and others (Daane et al., 2002; Jiang et al., 2015; Juhasz et al., 1997; Juhasz et al., 2000; Jung & Park, 2015; Kim et al., 2005; Lease et al., 2011; Samanta et al., 2002; Seo et al., 2009; Van Hamme et al., 2003; Wong et al., 2002; Zhao et al., 2008). Cultivation-based technique provides us with clues on how pollutants are biodegraded and the PAH degradation pathways. Furthermore, the genes associated with the degradation process have been identified, with particular emphasis given to the PAHs ring hydroxylating dioxygenase (PAHs-RHD) (Cebron et al., 2011; Moser & Stahl, 2001) and PAHs ring cleaving dioxygenase (PAHs-RCD) such as catechol dioxygenase (CAT) (Cebron et al., 2015; Peng et al., 2008) and protocatechuate dioxygenase (PACH) (Ohlendorf et al., 1987; Singleton D R & Schwartz, 1974; Thomas et al., 2016). However, microbial isolates are difficult to obtain and this method has proven to underestimate the diversity of the prokaryotic world greatly (Oren, 2004). In addition, it fails to explain the complicated interactions of the members of microbial communities with each other in their native environment (Jones et al., 2011).

In recent years, cultivation-independent methods, which can effectively evaluate the prokaryotic diversity of complex systems (Breznak, 2002; Rappé & Giovannoni, 2003), have been used to estimate the microbial degradation of PAHs (Huang et al., 2009; Jeon et al., 2003; Jones et al., 2008; Singleton et al., 2007). Metagenomic methods have revolutionized our ability to study the microbial communities in the environmental samples as they can provides higher resolution of the structure of complex microbial communities than conventional cloning and sequencing methods (Gutierrez, 2011). However, the metabolic feature of an organism cannot be inferred accurately by using this approach. Stable-isotope probing (SIP) is a cultivation-independent technique that circumvents the requirement to isolate an organism for the sake of the assessment of metabolic responses and links its identity to function (Dumont & Murrell, 2005). This technique has been used successfully on environmental samples by feeding microorganisms a stable isotope-labeled substrate to label the microbial DNA, allowing the identification and characterization of the target microorganisms that previously escaped detection, especially for those that are

not amenable to cultivation (Jiang et al., 2015). To date, SIP has been used to identify a great number of bacteria capable of degrading the PAHs (Gutierrez et al., 2013; Jones et al., 2011; Jones et al., 2008; Singleton et al., 2007).

Phenanthrene (PHE) is commonly used as a model compound for PAH biodegradation studies due to its ubiquity in nature and the fused-ring structure in an angular fashion (Jiang et al., 2015; Seo et al., 2009). Hitherto, SIP studies undertaken on PAHs biodegradation are limited to contaminated soil and water, such as road runoff polluted soils (Martin et al., 2012; Regonne et al., 2013), polluted soil from a former manufactured-gas plant site (Jones et al., 2011), and oil-contaminated waters from the Deepwater Horizon site (Gutierrez et al., 2013). However, SIP has not yet been applied to examine potential PAH-degrading microbial groups in PAH-contaminated sewage waters. In this study, DNA-SIP was applied to a sewage water sample in order to link the phylogenetic identity of bacterial taxa with their responsibilities for this in situ PHE degradation. In addition, cultivation based techniques and metagenomics were also used to achieve a more complete understanding of the bacterial communities that contributed to the degradation of PHE. Furthermore, the PAH specific ring-hydroxylating dioxygenase (PAH-RHD) and PAH ring cleaving dioxygenase such as catechol dioxygenase (CAT) and protocatechuate dioxygenase (PACH) were investigated by analysis of relevant sequences amplified from the ^{13}C-DNA enriched fraction or the DNA extracted from isolated PHE degraders. We hope to provide new useful information for the bioremediation of the PAH-contaminated sites and reliably theoretical basis.

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Concentrations and source apportionment of atmospheric polycyclic aromatic hydrocarbons (PAHs) at a regional background site of East China：abstract

Mao Shuduan

1. Introduction

Polycyclic aromatic hydrocarbons (PAHs) as an important class of POPs and culprits of carcinogenicity and mutagenicity[1] has aroused a wide concern. As a largest country in the PAHs emissions[2], China has been reported with high concentrations of PAHs [3~5]. Eastern China (27-40 ℃N) is the best sampling location for capturing the outflow plume of air pollutants from China to west Pacific[1,5]. In order to investigate the concentration levels, evaluate the influence of meteorological conditions and apportion the sources of atmospheric PAHs in eastern, Ningbo Atmospheric Environment Observatory(NAEO, 29°40.8′N, 121°37′E, 550 m ASL) was selected as a regional background site. 16 USEPA priority PAHs were analyzed in air samples collected at NAEO from November 2011 to August 2015.

2. Materials and methods

The 24 h successive air samples were collected once a week at NAEO by high volume air samplers with glass fiber filter (GFF) and polyurethane foam (PUF, 6.5 cm diameter, 7.5 cm length). Selected samples of each fortnight from November 2011 to August 2015 were used in my study. Chemical analysis procedure mainly included Soxhlet extraction, purity and GC-MS analysis.

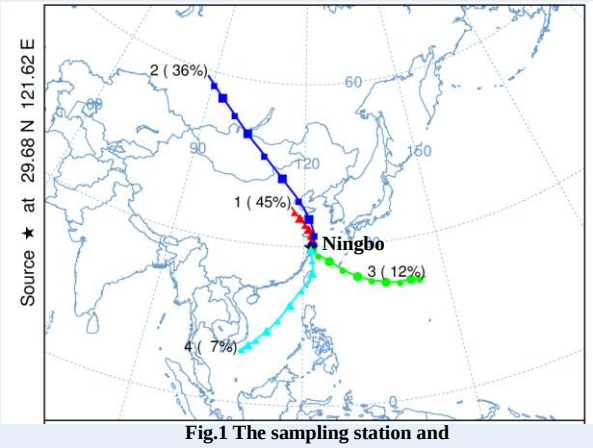

Fig.1 The sampling station and the major directions of air mass back trajectories

3. Results and discussion

3.1 Concentration of PAHs

The sum of the measured 16 PAHs (Σ_{16}PAHs) of gaseous PAHs and particulate-bound PAHs in air ranged from 2.69~108ng/m^3 and 0.02~56.66 ng/m^3, with arithmetic means of 22.94±15.67ng/m^3 and 10.87±14.53 ng/m^3, respectively. The concentrations of total (gaseous+ particulate-bound) Σ_{16}PAHs ranged from 3.89~130.25 ng/m^3, with a mean value of 33.81±26.13 ng/m^3. Compared with the mean values of gaseous Σ_{16}PAHs(32.4±18.1 ng/m^3), particulate-bound Σ_{16}PAHs(12.9±14.8 ng/m^3) and total Σ_{16}PAHs(46.0±23.4 ng/m^3) from 2009 to 2010 reported by Liu[6], Our results of PAHs from 2011 to 2015 colleted at the same sampling site were lower. The decreasing trend possibly indicates a source decrease in eastern China.

The seasonal trend of PAHs with highest concentrations in winter and lowest in summer were observed in this study, which was agreement with Liu[6]. In summer, the concentrations of gaseous Σ_{16}PAHs were significantly higher ($P<0.05$) than particulate-bound Σ_{16}PAHs. The average concentration of gaseous Σ_{16}PAHs represented more than 92% of the total Σ_{16}PAHs. This may be ascribed to higher temperatures, allowing volatilization of volatile and semi–volatile PAHs onto gas phase, especially the low molecular weight PAHs. During winter, the difference of concentrations between gaseous Σ_{16}PAHs and particulate-bound Σ_{16}PAHs can be negligible. The average values of gaseous Σ_{16}PAHs and particulate-bound Σ_{16}PAHs were 55% and 45% of the total Σ_{16}PAHs, respectively.

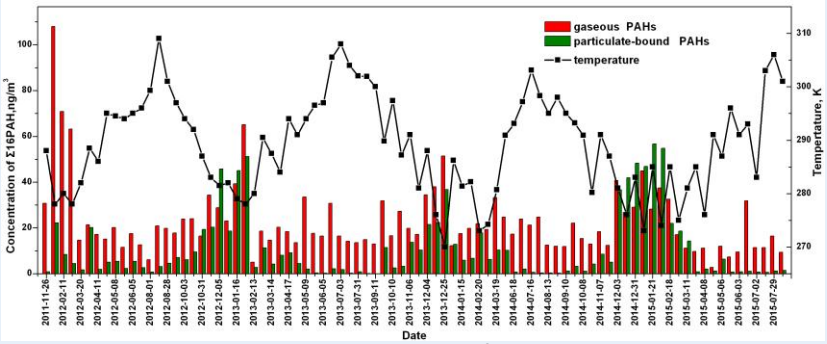

Fig.2 Concentrations of PAHs.

According to properties of the 16

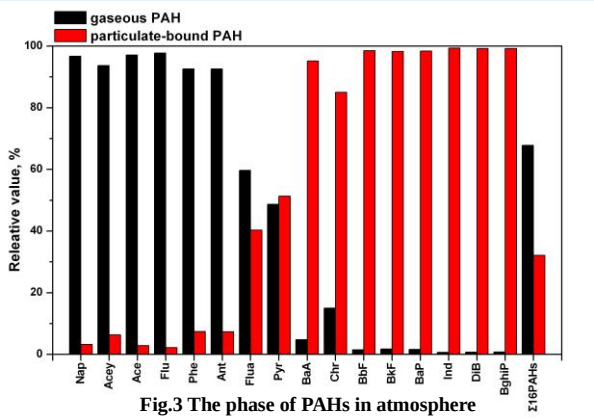

Fig.3 The phase of PAHs in atmosphere

PAHs, they can be devided into 2~3-ring (Nap, Ac, Ace, Flu, Phe, Ant), 4-ring(Flua, Pyr, BaA, Chr), and 5~6-ring PAHs (BbF, BkF, BaP, IP, DBA,BghiP). As shown in Fig.3, the low molecular weight, volatile 2~3-ring PAHs (Nap, Ac, Ace, Flu, Phe, Ant) were the main components of gaseous PAHs, which represented more than 90% of gaseous Σ_{16}PAHs. Particulate-bound PAHs were mainly consisted of BbF、Flua、Pyr and Chr. They were accounted for more than 50% of particulate-bound Σ_{16}PAHs.

3.2 Impact of temperature and atmospheric circulation

The relationship between temperature and gaseous PAHs was invsetigated by Clausius–Clapeyron equation. It showed that there was no statistically significant (P>0.05) correlation between gaseous PAHs or the correlation coefficients were poor for most congeners (r^2=0.04~0.30). It indicated that temperature-driven process of volatilization was not the controlling factor for PAHs; the air-surface exchange has less effect on the concentrations of PAHs.

Air mass origins were determined by employing NOAA's HYSPLIT model to calculate five-day air parcel back trajectories for each sampling period. As a result, four major directions were determined, which originated from inland central (direction 1), northwestern China (direction 2), Pacific Ocean (direction 3) and South China Sea (direction 4) (Fig.1).

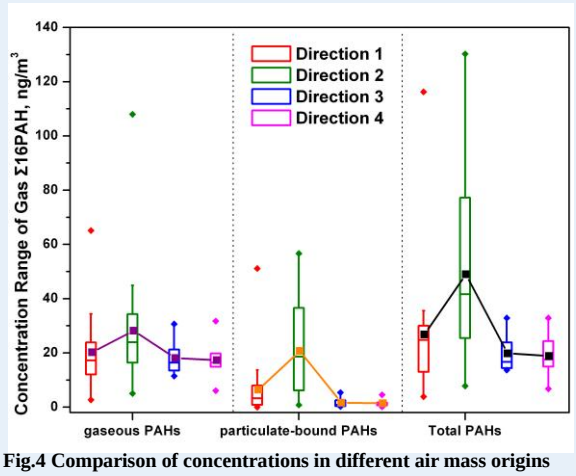

Fig.4 Comparison of concentrations in different air mass origins

The PAHs in different air mass origins were selected for sources identification. As shown in Fig.4, the concentrations of PAHs in direction 2 were significantly higher (P<0.05) than other directions. PAHs in direction 3 and direction 4 showed the lowset concentration levels. It suggested that, atmospheric circulation was the controlling factor for PAHs; and the source of PAHs mainly come from northwestern China. Poor temperature dependence and strong correlation with atmospheric circulation indicated that long-range transport controls atmospheric levels at the sampling site.

3.3 Source apportionment

Positive matrix factorization (PMF) was used to identify PAHs emission sources. A 86×16 (86 samples with 16 PAHs each) data set was introduced into the EPA PMF 5.0 modle and 3 factors were adopted. The results were shown in Fig.5.

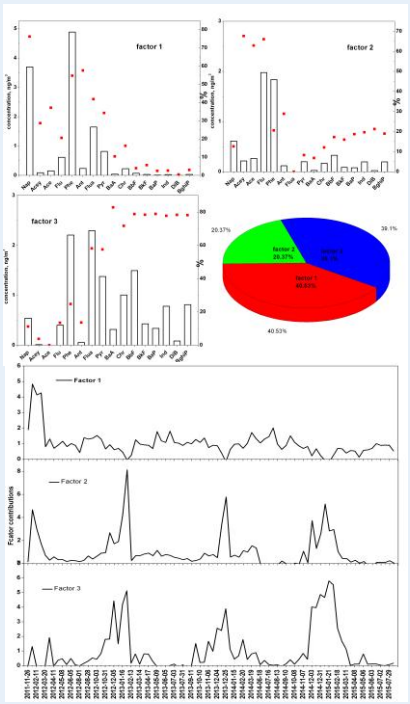

Fig.5 PMF analysis from 16PAHs data of total PAH

Factor 1 accounted for 40.5% of the sum of the measured 16PAHs. It has a high loading of 2~4 ring PAHs, including Nap, Ant and Phe, and moderate contributions from Flua, Ace, Pyr, Acey and Flu. Nap and Phe were the dominated compound in the burning of wood[7].It reported that, PAHs at NAEO could have similar sources with OC, EC and PM2.5[6]. Higher values of EC, OC/CE ratio and levoglucosan concentrations in summer at NAEO proved that biomass burning from surrounding area was one of the most major sources[6]. As displayed in Fig.5, factor 1 had a high contribution value in summer and a low value in winter. Hereby, factor 1 is characterized as biomass burning.

Factor 2 contributed 20.4% of the Σ_{16}PAHs. High loadings of Acey, Flu and Ace, and moderate loadings of Ant and Phe were observed. Flu has been considered to be tracers of coal burning[8,9].factor 2 showed high contribution value in winter could be resulted from coal combustion for heating in Northern China. Hence, factor 2 is assigned as coal burning sources.

Factor 3 explained 39.1% of the Σ_{16}PAHs. It was highly loaded with BaA, and moderately with BbF, BkF, BaP, Ind, DiB, BghiP. BkF, Ind and BghiP were always assigned as indicators of Vehicular emissions[8,10]. Ningbo is located in the southern part of the Yangtze River Delta (YRD), which is the most developed regions with a large number of vehicles. Accordingly, factor 3 was attributed to Vehicular emissions.

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磁性纳米颗粒简介

戴青

磁性纳米颗粒在生物医学领域引起了研究者的极大的兴趣，并获得了广泛应用。现阶段已有关于利用 MNP 作为生物分离载体的相关研究，主要集中在利用功能化的 MNP 表面配体与受体之间的特异性作用实现对目标的快速分离，该方法具有低干扰、过程温和、可直接分离的特点(Safarik and Safarikova, 1999)。同时，磁性纳米颗粒也是靶向给药的合适载体(Dobson, 2006; Hola et al., 2015)，可用于目标细胞标记和示踪(Patel and Lee, 2015)，并被证明可应用于癌细胞靶向治疗(Alexiou et al., 2006; Mangaiyarkarasi et al., 2016; Reis et al., 2016)。此外，超顺磁性氧化铁作为磁共振成像(MRI)技术的新型造影剂，具有组织特异性高、血循环半衰期长等特点，也成为近年来的研究热点(Feng et al., 2008; Lee et al., 2015; Sun et al., 2008)。磁性纳米颗粒应用于磁控生物传感器也有许多报道(Baselt et al., 1996; Baselt et al., 1998; Nehra and Singh, 2015; Yu et al., 2016)

磁性纳米颗粒拥有良好的生物相容性和可操控性，应用于有机污染物降解功能菌的研究中有着良好的前景。磁性纳米颗粒分离 (magnetic nanoparticle-mediated isolation, MMI) 技术(Zhang et al., 2015)是一种应用于原位环境选择性分离目标微生物种群的新兴方法。其主要机理是：1)向原位环境中加入适当比例的功能化的磁性纳米颗粒，并与微生物细胞充分混合，混合后的微生物细胞表面附着适量的磁性纳米颗粒后获得了磁性；2)施加污染物对原位环境造成胁迫，致使环境微生物群落中的研究对象与非研究对象在环境中生长状况产生较大差异；其中，在存在胁迫的情况下，目标微生物生长代谢正常，而其他微生物则生长缓慢甚至无法生长，导致细胞表面携带的磁性纳米颗粒的量有所不同，因而磁性存在差异；3)培养一段时间后，施加磁场对群落进行分离，进而获得所需微生物。获得的微生物可进一步通过分子生物学手段进行代谢、遗传分析。同时，使用后的磁性纳米颗粒可回收并重复利用(Lin et al., 2015)。其流程简图如图 1(Zhang et al., 2015)。

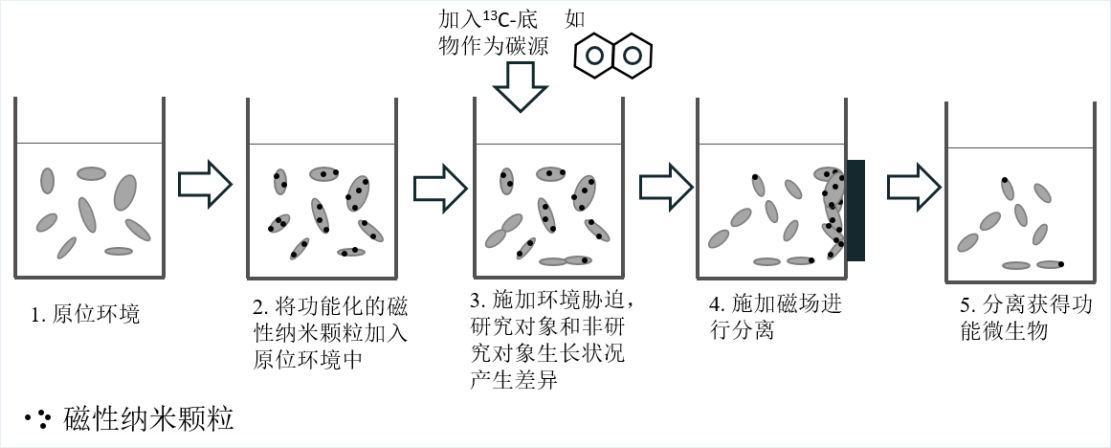

图 1. 磁性纳米颗粒分离技术简图

磁性纳米颗粒分离技术获得的是原位与降解相关的功能微生物群落，故其筛选所获得的并非单一物种。同时，获得的微生物群落可进一步与下游技术结合对功能微生物进行分析，进而获取研究对象遗传和代谢信息。此外，磁性纳米颗粒分离技术与其他功能微生物研究方法具有很好的兼容性和扩展性，适合于原位环境未知功能微生物的初步筛选。但该方法存在筛选精细度不高的特点，一些抗高浓度污染物的菌种会对结果造成干扰，还需要结合其他技术(如稳定性同位素探针技术，拉曼光镊技术)进一步筛选和验证。

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2016，赶赴心中的繁星春水

耿晓飞

接到出海采样的通知，内心很是兴奋，脑袋顿时嗡嗡的，几乎没怎么思考就答应了。

出发前，一分心忧伴着九分欣喜，忧的是手头的实验要搁置，喜的是多年对海洋的憧憬和向往终于从现实里走来。体检、疫苗、护照……复杂的手续办理，丝毫磨蚀不了旅途的热情期待。

16 年 3 月，我终于踏上了“实验一号”这艘想象了无数次的双体船。

刚开始的几天，所有的事物都充满了新鲜感。我像个急于了解世界的孩童，兴奋地观察着周围的一切，无视炽烈的阳光，在甲板上尽情地拍照。听说到了印度洋，天空会更蓝，海水会更美，所以我满心期待，希望尽快驶出南海。大家的激情也都很高，晚饭过后，我们会分好几桌，玩起自创的小游戏，一个个笑的前俯后仰，感叹着海上的生活真不错，轻松无负担。

然而，任何事情都是好坏参半的，长长的海上旅程，带给我们的不只美丽。我开始有晕船的症状，除了采样时间，几乎一整天都躺在床上，根本没有心情再去看那蓝蓝的天空与大海了。好容易慢慢适应了，却又进入新的状态——失眠。海上的睡眠很浅，睡不着的日子真难熬，数着秒的沉默里，觉得能睡着真是最幸福的事。

后来就想，正是因为这些难过的时刻，我们才更珍惜拥抱美丽的瞬间啊，然后心情好起来，心情一好一切就都好了。于是我再不整天待在舱里发呆，开始去船头吹海风。太阳变得更温柔了，什么都不想，静静地让自己融入这片海，感知每一个瞬间，体会每一丝感触。

天地有大美而不言，我却试图将自己感受的美景描述出来。不为别的，只为记住这些小时光，与人生第一次的印度洋。我选择写点儿小碎片，就像冰心的繁星春水，那陪伴了我成长的温软暖语。

Memorable moments

- 第一次看见飞鱼，它张着尖尖的小翅膀，嗖地冲出水面，在贴近海面的空中滑行了好远，却在落入海水的一刹那遭遇海鸥的急速猛冲，它的利爪瞬间扎进海里。我没有看清海鸥是否得逞，飞鱼是否逃脱，只是看见教科书里那一套物竞天择的理论在自然界中活生生地上演，心中五味杂陈。

- 第一次做站在西沙，船一停下，大家就拿出渔具来钓鱼。我趴在围栏上，海风吹着长发，满心惬意。海面下发着蓝光和白光的鱼群游近又漂远，很漂亮。钓鱼的收获颇丰，虽是鱿鱼，但个头很大，肚皮是半透的，半身的墨渍。另有一些小一点的深海鱿鱼，刚钓上船时红的很鲜艳，慢慢地，红色退去，白白的肚皮耷拉着，我禁不住偷偷摸了两下，软软的，滑滑的。食材好了，大厨登场，他三下五除二地把鱼片成片，用开水烫过两遍，调了料汁，我们就开筷了。夹一片蘸了料汁的乳白色半透明鱼片放进嘴里，味道很丰富，一层层地涌向味蕾，最后越嚼越香……我吃的很满足，算是出海后第一次尝到了海洋的味道。晚上刷过牙后，海鲜的味道都还在舌根久久回绕。

- 晚上，我喜欢趴在船头，跟舍友一起看星星，海风吹来，裹挟着浪花涌动的声音，仿佛站在浪尖，有种“踏浪”的感觉。第一次看到这么漂亮的星空，我们都很兴奋，互相指着自己认为最亮的一颗，好像回到天真无忧小时候。世界上最美的事物，莫过于夜晚的星空，和孩子的眼睛，所幸此刻，我们都有。第一次，我发现“一闪一闪亮晶晶，满天都是小星星”是多么贴切，只可惜，海上的美景中，只有这星空拍不进相机，收入不到相册。

- 在科伦坡的码头，也许每天叫醒你的不是闹钟，而是广播里的佛经。斯里兰卡是一个大多数人都信仰佛教的国家，这里随处可见洁白神圣的庙宇和金碧辉煌的佛像。第一次，我了解了什么是真正的信仰。还记得在加勒疯玩了一整天后，我们坐城际公交回科伦坡，一路上，只要看到佛像，售票员就会下车参拜捐款。在这里，我深深地体会到求佛人的真挚虔诚。

- 到了斯里兰卡，船上补给食物，买了海鲜，虾有半个碗那么大，仅仅炸熟，不放任何调料，一口下去，满嘴的鲜汁，那个味道，真是鲜的无可救药。第一次，算是真正体会到了海鲜的鲜。

Beautiful feelings

2016.3.26

月亮藏在厚厚的云朵后面，只露出一圈淡黄色的光晕，在海面上映出一道柔柔的微光，海风在耳畔呼啸而过，却也觉得静谧美好。白天还摇得倒胃，现在的心情却美丽得不要不要的。

2016.3.27

今晚，月满星稀。一轮明月，透彻明晰，在海面上铺出一条波澜的通天大道。只有一片薄薄的云彩，轻描淡写地挂在天际。

2016.3.29

夜空的星星，一颗一颗，像是镶嵌的钻石，璀璨夺目。

闭上眼睛，伸出双手，张开十指，夜风从指尖滑过，尽情感受她的温柔...

睁开双眼，那满天的星云也随她轻盈浮动...

翻看朋友圈，看到儿时伙伴发的动态:"生命在你手里像一条迸跳的鱼，你又想抓住它又嫌腥气"。突然觉得我们的人生渐行渐远，她做文案，以写作为生；她热爱阅读，总会有感人肺腑的笔触。我不爱阅读，不擅写字，所以每每羡极她的感悟。

然而不同的生活与经过，不会磨蚀掉从前的真诚梦想，反而会随之而来让人欣喜的遥遥相谈和心灵相携。此刻听着夜晚的海浪声声，我们聊着大海与心情。童年的回忆，是我们彼此最好的纪念。

童年，是一整天的画画练字和剪纸；

童年，是课间时光的皮筋沙包和毽子；

童年，是到处的疯跑，满街的欢笑；

童年，是天真无邪，是放肆地哭，尽情地笑。

2016.3.30

就让我成为这海风一缕好了，

掀起层层涟漪，与浪花嬉戏；

翱翔蓝天，与阳光融为一体。

傍晚，

吹起船头人儿的香发，吹走她万千愁绪；

偶尔，

与船儿开个玩笑，哼唱一段摇篮曲；

也可以飞向陆地，再把温柔带给海里和海上的你...

2016.3.31

那细细的波纹，是大海编织的蓝色的网么?

那闪闪的波光，可是大海捕到的眨巴的星辰?

2016.4.2

白白的云朵低垂，透明的阳光相随，风儿飞，风儿飞，大海来相陪。

柔软的脸颊贴近，暖暖的足迹靠近，这份软，这份暖，大海来体会。

2016.4.8

那天空中的一抹云霞，是空气中飘落的樱花，是神仙姐姐的桃色仙纱。

我仿佛嗅到了那粉色的芳香，涌动，淡雅。

是樱花?还是仙纱?是晚霞。

2016.4.9

夜空那一弯新月，是那一低头的温柔，是不胜莲花的娇羞。我分明看到了它收敛的脸庞，圆润，饱满，却只露出那么一弯，像美人犹抱琵琶半遮面，像少女低垂娇羞的眉眼，像新娘幸福温柔的容颜，也像孩童天真烂漫的笑脸。

2016.4.12

半满的一弯银月，像一只通透的小船，悠悠地飘在天际。

夜空便是它的大海，云儿便是它在海中的倒影。

它是那么梦幻，像是孩童梦里的童话；

它是那么浪漫，仿佛满载着少女憧憬的爱情。

2016.4.17

夜幕下的斯里兰卡，灯火阑珊。

仿佛海天之间镶嵌的颗颗宝石，五彩斑斓。

2016.4.24

今晚的月亮是那么明亮，仿佛照亮了整个世界，

白白的云朵，透亮的大海，还有她周围彩色的光晕。

不是阳光的那种炽烈，全世界都满足地感知着她的爱抚，

软软的云朵，温柔的海风，还有被融化了的烦躁的心。

2016.5.2

喜欢趴在船头的围栏，

低头看夕阳下，海面上，圆溜溜亮晶晶的泡泡；

想象着，海流中，珊瑚旁，快乐的鱼群在嬉戏游玩。

我喜欢站在甲板，

凝望灯光中，海面下，一串串悠悠升起的泡泡，隐隐约约，五彩斑斓；

想象着，深海中，海草间，幸福的鱼儿在轻声低语。

2016.5.3

风儿打海面经过，留下了她的足迹，便有了波浪涟漪。

2016.5.4

夕阳西下，映红了云朵的脸颊；凝望这那红彤彤的笑脸，大海也漾起了微红的光晕。

一场繁星春水的遇见，一个风尘仆仆和满心欢喜的我。我用我稚拙的笔，为这场美丽写下纪念。